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A.I.D. Project Impact Evaluation Report No. 15

The Philippines: Rural Electrification

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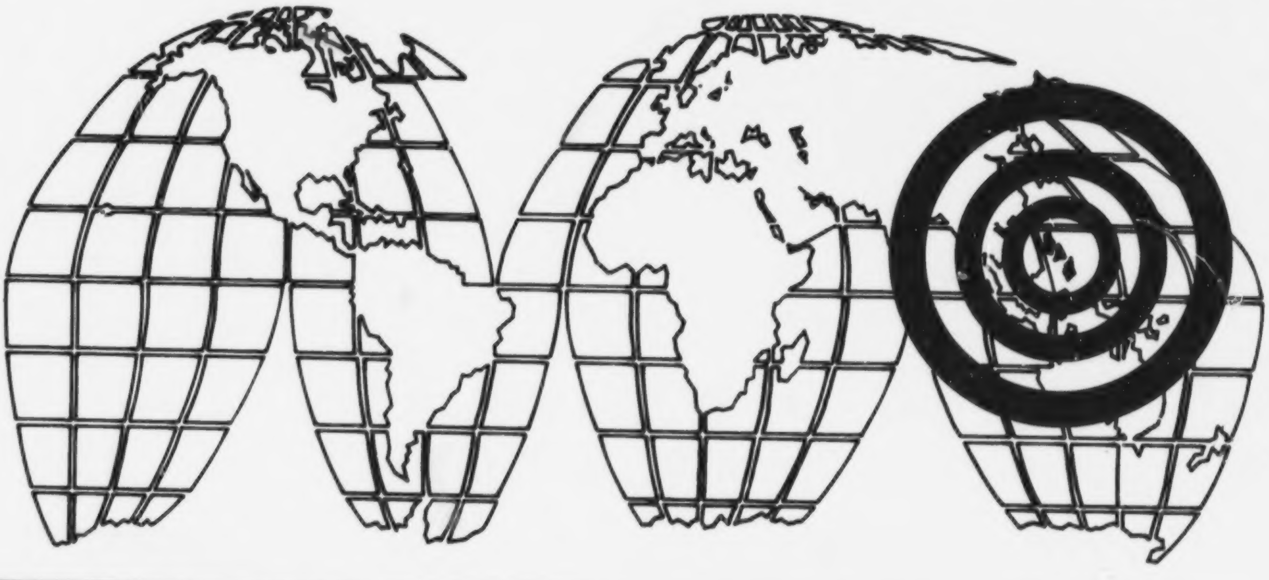

December 1980

Agency for International Development

PN-AAH-976

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THE PHILIPPINES: RURAL ELECTRIFICATION

PROJECT IMPACT EVALUATION NO. 15

by

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Agency for International Development

December 1980

The views and interpretations expressed in this report are those of the authors and should not be attributed to the Agency for International Development.

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Foreword

In October 1979, the Administrator of the Agency for International Development requested that, in preparation for an Agency-wide ex-post evaluation system, between twenty and thirty projects be evaluated during the subsequent year, focusing on the impact of these projects in several representative sectors of the Agency's program. These impact evaluations are to be performed by Agency personnel and result in a series of studies which, by virtue of their comparability in scope, will ensure cumulative findings of use to the Agency and the larger development community. This study of the impact of the Philippines Rural Electrification Program was conducted in April 1980 as part of this effort. A final evaluation report will summarize and analyze the results of all the studies in each sector, and relate them to program, policy and design requirements.

Summary

1965 marked the beginning of A.I.D.'s involvement in rural electrification in the Philippines when it financed a power survey which recommended testing the feasibility of extending electricity to the rural areas. Following the feasibility study done by the National Rural Electric Cooperative Association (NRECA), A.I.D. assisted the Government of the Philippines in creating two pilot cooperatives, MORESCO and VRESCO. Since these first steps, $382 million have been invested in rural electrification in the Philippines. A.I.D. has contributed more than $92 million to finance equipment, engineering consultant services and extensive technical assistance provided by the NRECA. This large investment has resulted in the establishment of the National Electrification Administration (NEA), which is planning and implementing an ambitious program with the following targets:

- Completion of backbone (main distribution lines and key lateral lines) systems and energization of all towns and cities by 1980;
- Energization of all barrios by 1985; and
- Total energization by 1990 (recently shortened to 1987).

As of February 29, 1980 the following physical accomplishments had been recorded by NEA:

117	cooperatives registered
101	cooperatives energized
844	municipalities energized (59% of total)
9,088	barrios energized (27% of total)
1,159,434	households electrified (20% of total)

The team found the impact of the rural electrification program on both the process of economic development and the rural poor to be limited. There were, however, enough examples of positive effects to permit the team to draw conclusions about the conditions which must exist and criteria which must be met if a rural electrification project is to have positive impacts on development and the poor.

Those areas where electricity had a positive effect on development were characterized by a concentrated population, diverse markets, availability of capital and technical skills, and proximity to a larger market. These were places such as market towns and areas near to Manila where there were more opportunities to use power productively and which were at a relatively more advanced stage of development. The team also found positive effects on economic development where investments and projects in power-dependent activities were actively promoted.

The team observed that a large segment of the poor were unable to make productive use of electricity. Of this group, a substantial portion could not afford to have their houses wired. They received only the benefits of community lighting such as greater security and increased community and social activity if their barrio had public lighting. Another portion could afford the wiring but could only afford the monthly cost of one or two light bulbs. This group received the social and community benefits and also saved money because, in most places, kerosene lighting is more expensive. Examples of the use of electricity to break out of the poverty cycle were found as one moved up the socio-economic scale. The people in this group often had skills and savings or access to family resources to use with the electricity.

Based on these observations the team drew the following conclusions:

1) The introduction of electricity does not automatically stimulate economic growth. The contribution electricity can make will depend on the level of development of the area and the programs and projects which utilize power.

2) The poor derive social and community benefits from electricity and some obtain cheaper, safer, better lighting. The most important benefits of electricity should be new employment opportunities, higher levels of productivity, and extended and improved public and social services. These benefits will flow to the rural poor only if electricity is used as an element of the development process and the development process, itself, is directed to meeting the needs of the poor.

3) The use of cooperatives for distributing electricity does not guarantee democratic participation of the members. The selection of an appropriate organizational form should give greatest weight to the need for effective management rather than other criteria such as the participation of beneficiaries or democratization of the development process.

4) The financial viability of rural electric distribution systems is difficult to achieve if they expand rapidly into far-flung, thinly populated rural areas. Financial problems are further exacerbated by rising energy costs. Conversely, encouragement of the productive uses of power and slower rates of systems expansion should improve the chances of achieving this goal.

5) Rural electrification does not substantially increase energy demand because the additional demand for energy caused by electrification is small and electricity is often substituted for other fuels.

Based on the above conclusions, the team urges cautious and careful study in programming funds for rural electrification. The availability of alternative projects, the desire and commitment of the host country and other country-specific factors should affect the Agency's decision. Future studies and evaluations of rural electrification should focus on identifying the pre-existing conditions and complementary programs which must exist to ensure that electrification has a positive impact.

Acknowledgements

The team wishes to thank the National Electrification Administration (NEA) for the support it provided. Reports, studies, data, briefings, a vehicle and an escort officer were made available to the team. Without this assistance the study would not have been possible. The team would like to thank Deputy Administrator Dave Aguila, who met with the team twice, once in the field by happy chance and again at the end of the team's stay in the Philippines. Mr. Aguila provided information and valuable comments on the team's findings. Though many others in NEA helped us, we would like to specifically thank Emy Villanueva, Pet Villarte and Manuel De Los Reyes who devoted a great deal of time and attention to us. The people in the rural electric cooperatives who assisted us are too numerous to mention. Suffice it to say that the team was welcomed warmly everywhere, receiving excellent support and assistance. Finally, the team would like to acknowledge the support and assistance provided by various members of the staff of USAID/Philippines. Several officers took time to talk with team members and to provide useful documents. The excellent map included in the report was prepared by V. G. San Jose, Chief Artist of USAID/Philippines' Communications Media Division.

Project Data Sheet

1. Country: Philippines

2. Project Titles, Numbers and Dates

Power Survey Grant, 1965
Feasibility Study Grant, 1967
VRESCO Loan, 492-H-025, August 1968
MORESCO Loan, 492-H-026, August 1968
Technical Assistance Grant, 492-11-220-248, April 1972
Rural Electrification Loan for Engineering Services, 492-H-027, November 1971
Rural Electrification Loan for Equipment, 492-H-028, May 1972
Rural Electrification Loan II, 492-T-034, August 1974
Rural Electrification Loan III, 492-T-036, March 1975
Rural Electrification Loan IV, 492-T-043, August 1976
Rural Electrification Loan V, 492-T-047, January 1978

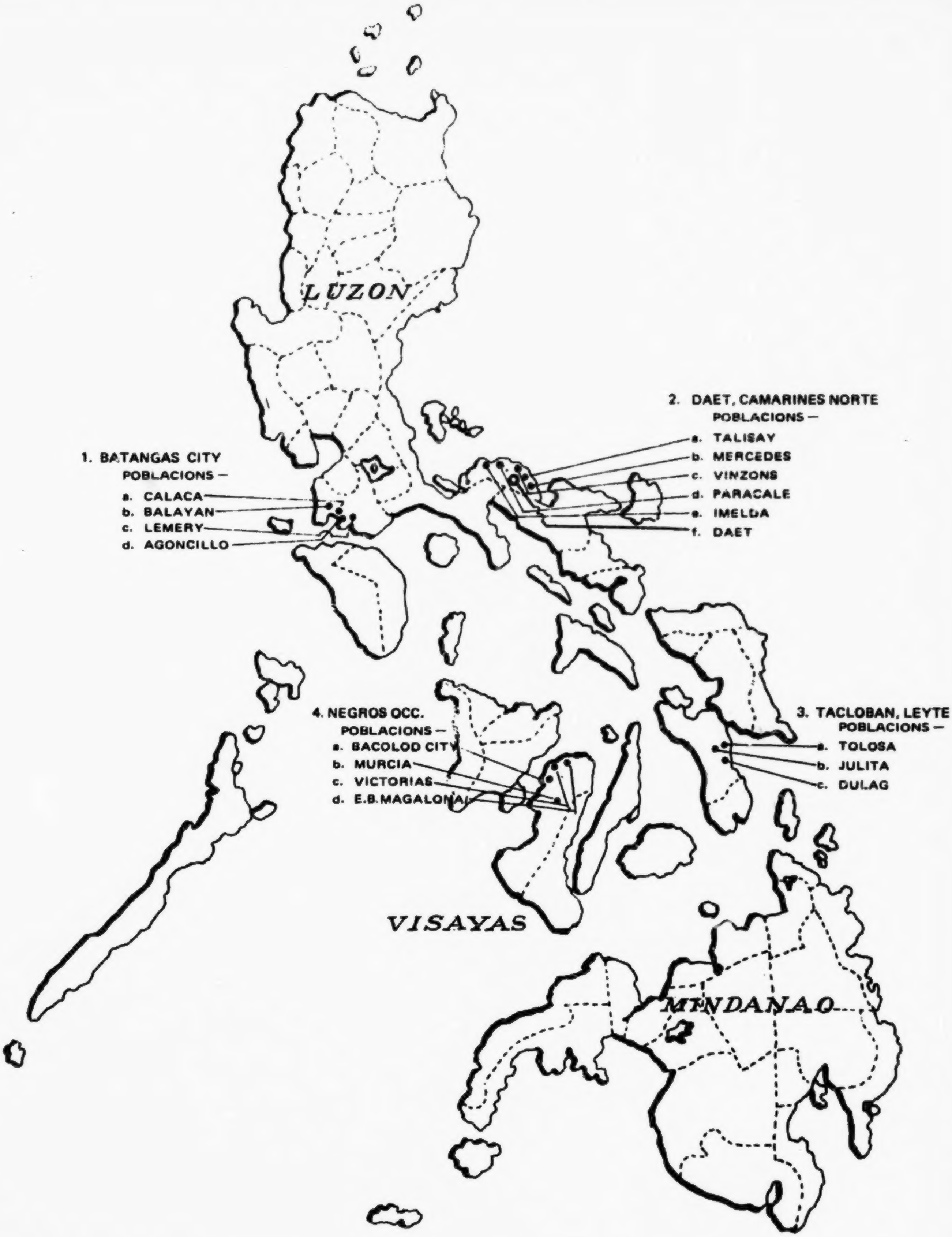
3. Project Funding as of December 30, 1979

U.S. Grant Funds	$ 2,950,000
U.S. Loan Funds	89,200,000
Other Donor Funds	132,000,000
Government of Philippines Funds	158,000,000
Total	$382,150,000

[redacted]

Glossary

Barrio/Barangay	Subdivision of a municipality
CDSS	Country Development Strategy Statement
FSDC	Farm Systems Development Corporation
Gigawatt	1,000 megawatts = 1,000,000 kilowatts
GOP	Government of the Philippines
ISA	Irrigators' Service Association
Masagana 99	Government program to increase rice yields with the ultimate target of achieving national self-sufficiency in rice
Municipality	County-level political sub-division of a province
NEA	National Electrification Administration
NPC	National Power Corporation
NRECA	National Rural Electrification Cooperative Association
Poblacion	an urban concentration within a municipality; usually divided into barrios which are like U.S. wards
Sari-sari store	small retail outlet selling cold drinks, cigarettes, food items, etc.
Exchange Rate	$1.00 = Peso (P) 7.35


LUZON
2. DAET, CAMARINES NORTE
POBLACIONS —
a. TALISAY
b. MERCEDES
c. VINZONS
d. PARACALE
e. IMELDA
f. DAET
1. BATANGAS CITY
POBLACIONS —
a. CALACA
b. BALAYAN
c. LEMERY
d. AGONCILLO
4. NEGROS OCC.
POBLACIONS —
a. BACOLOD CITY
b. MURCIA
c. VICTORIAS
d. E.B.MAGALONA
3. TACLOBAN, LEYTE
POBLACIONS —
a. TOLOSA
b. JULITA
c. DULAG
VISAYAS
MINDANAO

I. Background

A. Introduction

A modern society without electricity is difficult to imagine. Yet how electricity fits into the process of development remains an unanswered question. At what stage of development should electricity be introduced into a poor, developing country? What other resources are needed to maximize its benefits? To whom should it be delivered? At what cost?

The unique and ambitious rural electrification program in the Philippines represents one answer to these questions. Under a presidential mandate and with the help of the Agency for International Development (A.I.D.) and other donors, the Government of the Philippines (GOP) plans to electrify the entire country by 1987. Underlying this program is the belief that electricity will: be the cutting edge of rural development; make the rural areas more productive and more secure; attract more industry and lead to greater employment opportunities; create the good life.

To find out what difference electrification has made in the lives of the rural poor and what impact it has had on development, the team visited four different areas of the Philippines. These ranged from Batangas, a relatively well-off area of southern Luzon benefiting from its proximity to Manila, to Camarines Norte, a rather neglected province in the Bicol region, to the poor islands of Leyte and Negros in the Visayas. We looked for areas of high-cost energy as well as those where energy is cheap. We selected regions with a range of economic activities: from sugar plantations to tenant farmers growing coconut to small holders growing rice; from industries in small towns to handicrafts in poor households. We talked to nurses, teachers, priests, politicians, bank managers, policemen, fishermen, children, housewives, rice farmers, cane workers and coconut farmers. We spoke with those who had power in their homes and those who did not; those who used it in their work and those who did not; those who planned to get electricity and those who did not.

The team did not find simple answers to the questions raised above. On the one hand, the impact of rural electrification on both the process of development and on the rural poor is very limited. On the other hand, we did observe a sufficient number of examples of positive effects to be able to describe, in broad, general terms, a continuum of impacts on local economies and individuals ranging from almost none to substantial. In this context, we also could identify some of the factors which caused electrification to have these positive effects. The team has chosen to devote its efforts in this report to describing this continuum of impacts and the conditions underlying them.

B. AID Involvement

An A.I.D.-financed power survey in 1965 recommended a program to determine the feasibility of extending electric power to rural areas of the Philippines. To implement this recommendation A.I.D. employed the National Rural Electric Cooperative Association (NRECA) to conduct feasibility studies for two pilot rural electric cooperatives. Two sites were selected, one in Misamis Oriental on the island of Mindanao and the other in the Victorias-Manapla-Cadiz area of the province of Negros Occidental on the island of Negros. After detailed feasibility studies were completed, A.I.D. made two development loans totalling $3.1 million which, with Philippine Government loans totalling P 6.6 million, financed the creation of pilot cooperatives, MORESCO and VRESCO, and the construction of transmission and distribution lines to supply power to cooperative customers.

The A.I.D. loan financed engineering services and equipment. A.I.D. also provided a grant of $350,000 to finance further work by NRECA to design a national program of rural electrification. In FY 1972, A.I.D. authorized two loans and a grant to implement the national program. A small loan of $600,000 financed the cost of an engineering consultant to develop the engineering capacity of the newly formed National Electrification Administration (NEA) through technical assistance. A larger loan of $19.4 million financed the cost of engineering design services and equipment (new and excess property). The grant of $2.3 million paid for the services of NRECA which provided extensive technical assistance to NEA and the cooperatives in non-engineering areas. Subsequently, A.I.D. made four additional loans totaling $66.3 million for equipment and services. The total A.I.D. investment in rural electrification in the Philippines, therefore, has been $92.15 million.

C. Project Description

The implementing agency is the NEA which is responsible for overall planning and implementation of the national rural electrification program. The NEA makes long-term, low-interest loans to cooperatives which it helps to establish. The loans are actually lines of credit for equipment and materials which NEA purchases with foreign exchange loans such as those provided by A.I.D. NEA maintains close supervision of the cooperatives once they are formed by virtue of the loan agreements between NEA and the cooperatives. NEA provides training for cooperative staff members in all aspects of cooperative management, operations and maintenance of the distribution system. NEA also provides technical assistance to the cooperatives in dealing with specific problems.

The rural electric cooperatives are non-profit membership organizations which own and operate the power distribution systems. New cooperatives have interim boards appointed by NEA and acting general managers who are employees of NEA. As the cooperative matures, the interim board is usually replaced by an elected board and the acting general manager is replaced by one who is actually employed by the cooperative (with NEA approval).

Cooperatives vary greatly in size and operating conditions. Some obtain all their power from a transmission grid operated by the National Power Corporation (NPC). Some must operate their own diesel generators or buy power from other cooperatives which have generators. Some obtain power from several sources. Most cooperatives took over private franchise systems which usually supplied power to larger municipalities, often for less than 24 hours a day. These systems were old and in poor operating condition and the cooperatives have had to rehabilitate them as rapidly as possible to reduce line losses and interruptions while extending coverage into previously unelectrified areas.

The targets for the national program are:

- Completion of backbone (main distribution lines and key lateral lines) systems and energization of all towns and cities by 1980;
- Energization of all barrios by 1985; and
- Total energization by 1990 (recently shortened to 1987).

As of February 29, 1980 the following physical accomplishments had been recorded by NEA and the cooperatives:

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844	municipalities energized (59% of total)
9,088	barrios energized (27% of total)
1,159,434	households electrified (20% of total)
216	pumpsets irrigating 20,100 hectares
276	rural water systems serving 148,573 people
28,733	school rooms electrified in 2,610 schools

II. Findings

A. The Effectiveness of the A.I.D. Project

1. Goals and Purposes

The goals and purposes of A.I.D. and the Government of the Philippines were basically similar during the initial stages of the rural electrification project. Both parties appeared to have accepted the example of rural electrification in the United States as evidence that the welfare of people in the rural areas would be improved by electrifying rural households. In addition, the Government of the Philippines had the political objective of demonstrating in a dramatic, concrete way that the central government was sensitive to rural needs and, therefore, deserving of the political support of rural people.

The Government of the Philippines continues to hold these objectives and, accordingly, continues to pursue a strategy emphasizing rapid system expansion and electrification of households. Meanwhile, A.I.D. thinking has evolved toward more explicit expectations about the employment and income effects of rural electrification. The measures of goal achievement have become precise as shown by A.I.D.'s Rural Electric V loan project paper which asserted that by 1980 at least 20 percent of residents in cooperative areas would realize incomes from jobs that did not exist prior to electrification. Having changed the rhetoric in its project papers, however, A.I.D. sought no changes in the project design to improve the chances of meeting the more specific economic goals. A.I.D. assumed that the introduction of electricity would elicit a spontaneous response from private and public investors that would be adequate to meet the new goals. As the following sections demonstrate, actual experience indicates this assumption is not correct.

Project design and implementation have been suited to achieving the social and political objectives of the Government of the Philippines. In order to meet A.I.D. economic goals and purposes as expressed in later project papers, it would have been necessary to restructure the project so that some of the resources expended on all-out household electrification would be diverted to locally based efforts in support of investments in small to medium scale electricity-utilizing industries and to increase the use of electricity in various social services.

2. Inputs and Outputs

At the input and output level the project was successful. Equipment and services were provided as planned and appear to have been the correct ones since they resulted in the desired outputs, physical infrastructure and viable institutions. At each of the cooperatives visited, warehouses were found to be stocked with A.I.D.-financed equipment. Many NEA and cooperative employees had worked with the engineering and technical advisors financed by A.I.D. who assisted them with various technical problems. Many cooperative managers and employees had been trained by U.S. advisors. All the cooperatives had been visited by advisors who reviewed various aspects of cooperative operations and made recommendations for improvement.

The NEA is a strong institution. It is well managed and fully capable of carrying out its assigned mission of electrifying the country. Because it is effective, NEA is being asked to become involved in other development activities. The cooperatives are also, by and large, well-managed organizations. Most are fully capable of managing their own affairs. The physical accomplishments of the project are listed elsewhere.

At the input-output level the project has been successful because the Philippines Government has given it sufficient priority to attract qualified people and A.I.D. provided enough technical assistance and training for enough time to ensure that the institutions were properly formed and adequately staffed. The NEA was also equipped with a training system to ensure a flow of competent people.

3. Two Special Aspects of the Project

a. The Cooperatives as Development Institutions

One of the major benefits expected from using cooperatives to deliver power was to be participation by rural people which would have a spill-over effect on other development activities. This expectation has been largely unfulfilled. As reflected in the composition of the cooperative boards of directors, in the meetings and elections designed to tie them to their members and in the process of decision-making, membership influence over the cooperatives has been minimal. The boards of directors are dominated by government employees, businessmen, sugar planters and professionals such as lawyers and accountants. They contain no skilled workers, rural workers or small farmers. Meetings and elections, when held at all, reflect a minimal impact by the general membership.

This lack of popular participation results in apathy toward cooperative activities and appears motivated by fear of local political influence on the part of the cooperative management. As one cooperative leader put it, "If someone representing the community was elected he might not understand electricity and things would not run smoothly."

b. Financial Viability

The project envisions the cooperatives evolving into financially sound entities capable of financing current operations and debt service. The Government's objective of maximizing the connections to rural households, however, has weakened the financial viability of many cooperatives. The rapid expansion of coverage to far-flung barrios has caused many cooperatives to postpone the establishment of an adequate sinking fund in favor of increased construction expenditures. This, combined with a reluctance to raise consumer rates promptly in response to the increased cost of power, prevents many cooperatives from earning adequate surpluses for repayment of NEA loans. To date, the more solvent cooperatives have provided sufficient surpluses to cover NEA's own repayment obligations, but steps will have to be taken to improve significantly the financial strength of the majority of cooperatives before a sharp increase in NEA's repayment obligations occurs in 1983.

Two factors may mitigate the impact of these policies on the financial health of many cooperatives: (1) some of the self-generating cooperatives will be able to switch from costly local sources of power (e.g., diesel generators) to more reliable and efficient supply from the central grid or to cheaper forms of locally generated power (e.g., dendro-thermal - wood-fired generating plants using specially grown trees); (2) the GOP's planned regional dispersion of industry will provide more cooperatives with a firmer revenue base from which to expand coverage to the more sparsely populated areas.

B. Rural Electrification and Economic Development

1. General

The impact of electrification seen by the team in each area depended on the level of development of the area. The team concluded that, by and large, electricity must be introduced after and/or in conjunction with a variety of other public and private investments and programs in order to have a significant impact on economic development.

Not suprisingly, power-based development was more apparent in poblaciones (the urban center of a municipality) and market towns than in the rural barrios (districts) of the municipality. With a more concentrated population, diverse markets, greater socio-economic differentiation and access to capital and technical skills, there were more opportunities to use power productively and more people ready and able to avail themselves of power-related opportunities. Proximity to a larger market also had an important positive influence on the impact of electrification.

Calaca in Batangas, a town of about 5,250 households, received efficient, low cost, round-the-clock power service in December, 1974. A local elite family invested in a new ice plant and woodworking shop. Welding and vulcanizing shops were opened. Public lighting in the market, main street and plaza enlivened the center of town, prompting increased commercial activity in the evening. Batangas is relatively well off. It has a good road connection to Manila which is only two hours away. It is clearly an expanding area with a good location and resources for development. The team did not find similar responses to the introduction of power elsewhere.

2. Impact on Industry

The critical factor in determining the extent to which electricity is exploited for industry appears to be access to start-up capital. A significant difference between individuals who use electricity for productive purposes and those who use it exclusively for household purposes is their access to capital. In some cases, the former also have acquired non-agricultural skills and have been exposed to the modern sector of the economy. At the community level, too, the availability of capital is critical to determining the industrial response to rural electrification.

The relatively wealthy local families with adequate savings of their own or easy access to commercial credit tend to be the ones who establish the medium-scale enterprises. These enterprises generate the most non-family employment and introduce the least traditional types of new economic activity. Often these enterprises rely on markets outside the immediate area. The de Leon's woodcraft shop in Calaca, Batangas, for example, employs sixty-eight people to produce wooden bowls and trays for export to Japan. The de Leon family has substantial local landholdings, is active in civic affairs and has invested in other electricity-using enterprises.

Individuals from marginally poor backgrounds may accumulate capital from outside the local area (e.g., as a result of employment in Manila or remittances from family members living abroad) and invest in small electricity-powered enterprises whose output is primarily for local consumption. These enterprises generally do not generate much employment beyond the family, but they do provide the basis for the emergence of a new set of local entrepreneurs who may be able to invest in more significant employment-generating activities in the future. In the meantime, they are lifting themselves and their families out of poverty.

After completing high school, Franco, age 31, acquired some savings and public relations skills while working for Kimberly-Clark in Manila. When his barrio was electrified he returned to establish an electric rice mill using his savings, his family's resources and a bank loan. The mill is operated by his father, brothers and one helper outside the family. The establishment of similar electric rice mills and the conversion of existing mills from diesel power to electricity was the most widespread industrial response to electrification that we observed.

Small home-based service enterprises are sometimes established by individuals who have borrowed a few thousand pesos from a relative or have access to other sources of capital. Often these activities are undertaken by people with farming backgrounds who were earning an inadequate income in agriculture and who developed a non-agricultural skill through informal training. The output or services of their enterprise is consumed locally, and the employment generation is limited to the owner and one or two helpers. The services provide support for other modernizing activities in rural society (e.g., communications, transportation). Armando Alap's metalcraft shop in Vinzons, Camarines Norte, consists of his front yard and a wooden roof over some of his electrically operated machinery for making small paddy threshers. He established the metalcraft shop with a P 1,000 loan from his parents. He is largely self-taught in metalcraft and mechanics. Four of his children help with the shop. Sam's Welding Shop in Dulag, Leyte, was established in 1978 by Manuel Sia, who was previously a copra dealer/coconut farmer and is self-taught in welding. Most of his business consists of repairing jeepneys and motorcycles for people from Dulag poblacion and its surrounding barrios. His only helper was formerly a hunter. Two sewing operations were found in Batangas using electric machines. At one, children's clothes were being assembled and at the other, children's clothes were being embroidered or appliqued. In both cases the final product is for export.

In addition to the industrial uses of electricity cited above, we observed very widespread use of electricity in sari-sari stores (lighting and refrigeration of soda and beer). Both the stores and the sewing operations are run largely by or employ women and constitute a secondary source of family income.

Perhaps the most imaginative productive use of electricity is a streetlight installed on the beach at Camachlisa, Batangas to serve as a navigation light for fishermen, permitting them to venture further out to sea and to fish in poor weather.

In contrast, the evaluation team saw cases in which the introduction of electricity has had almost no employment or productivity impacts on the rural areas of the country. A fishing village, Tolosa, in Negros Occidental, in the VRESCO service area has had power since 1969. The fishermen are quite well off, earning, by their collective recollections, P 500 per month at a minimum. Almost all have electric lights in their homes but none use it productively except for the owners of two sari-sari stores. The villagers said that there are four TVs and four refrigerators in the village.

Beyond the provision of capital, the reliability of electricity appears to be a critical factor in encouraging investment in electricity-based production activities. In Leyte, the cooperative's inability to generate uninterrupted power is definitely an impediment to development. Potential investors in large-scale enterprises (e.g., abaca processing) were informed that they could not be provided with power and would have to await the completion of the Tongonan geothermal plant and the cooperative's connection to the Leyte-Samar NPC grid. Plans for the mini-industrial estate are dependent upon reliable power.

At the level of small- and medium-scale operations, the negative impact of unreliable power is also evident. During our visit to de Leon's woodcarving shop, at least a dozen workers were idled by an unannounced twelve-hour blackout. The workers were not paid for the time spent waiting for the restoration of power. The Balce Rice Mill in Vinzons was unable to operate during a three-hour blackout on the afternoon of our visit. The competition down the street, which still had a back-up diesel motor, was able to operate during the power outage.

3. Impact on Agriculture

The introduction of electricity has not had a substantial impact upon cultivation in the areas that we visited. Government assistance to farmers does not have an important electricity component. The Masagana 99 program to increase rice yields appears to concentrate on arranging credit for agricultural inputs (e.g., seed, fertilizer, etc.) and providing technical assistance to farmers in the selection and use of these inputs. Rural banks concentrate on traditional production loans, often in collaboration with the Masagana 99 technicians; they are not promoting loans for irrigation. Nationwide, the cooperatives are providing electricity for 216 pumpsets irrigating 20,100 hectares. The only case that we observed of an electricity-based irrigation system was a failure due to faulty design. We were told, however, that the implementing agency for small scale irrigation and the NEA are working together, not without problems, but working together nonetheless.

The installation of electric irrigation pumps appears to be too costly for small paddy farmers whose fields tend to be far from distribution lines (entailing a substantial connection cost) and in many instances are scattered. Coconut farmers do not use irrigation, and the fact that vegetables are grown in very small plots (usually for home consumption) or as a ground crop among coconut trees limits the opportunity for electric-powered pumps in their cultivation.

4. Impact on Health and Education

The team found that many schools are electrified under an NEA program. Few were used at night and then mostly for occasional meetings. The team heard of only one school which actually conducts night vocational classes. The team visited several health centers and interviewed public health nurses and midwives. All but one have been electrified, but none are used at night. One has a sterilizer, but it is broken. One has an electric stove for sterilizatión. None have refrigerators for preserving medicine. None have been reequipped as part of a program to take advantage of power. Mrs. Nora Torres, a public health nurse in Vinzons, Camarines Norte, said she has to take medicines home with her to refrigerate them. The rural health unit in Tolosa, Victorias, Negros Occidental, is not electrified though the village itself was electrified in 1968. Hospitals which used power were found in the larger poblaciones and provincial capitals. The team visited a well- equipped general hospital that had been electrified for a long time in Batangas.

5. Relationship to Other Development Interventions

Other than the cooperation between NEA and the small scale irrigation agency, the team saw little evidence of coordination between the suppliers of power and other government agencies. To the extent ancillary infrastructure was being developed (i.e., potable water systems), it was a direct undertaking of the NEA and the cooperatives. We saw power in areas which had severely deteriorated paved roads and no other amenities of life. For example, in the newly electrified village of Potuga, Batangas, the road was unpaved and the inhabitants had to walk 450 meters to a river for water.

C. Rural Electrification and the Poor

1. Introduction

The social and economic position of an individual and his family determines whether they will derive any benefits from electrification and, if so, the type and amount of benefits. There are the very poor who receive virtually no benefits and upon whom electrification has a negligible impact. There are those moving up economically for whom electrification is an opportunity to be seized and used to directly increase their incomes and productivity. In between is a broad spectrum of adopters and non-adopters of electricity who obtain a mixture of direct and indirect benefits depending upon where they live and the resources available to them.

Most of the Filipino rural poor are unable to make productive use of electricity. Either they cannot afford electricity at all or can only afford the minimal use of a light bulb or two. While appliances can be used to increase incomes, few people in the rural Philippines can afford them. Because of the inadequacy and instability of their incomes or the unpredictability of the charges against this income (medical disaster) or their own spending preferences (education), very few are willing or able to take the risks invovled in investing in productive uses of electricity.

2. The Economics of Adopting Power

By analysing the incomes of the people we interviewed, we estimate that those whose potential earnings are above P 5000 per annum are able to afford to wire their homes. While we found people with greater incomes who did not adopt power and vice versa, we feel this dividing line is sufficiently accurate to be useful for analytic purposes. To put this in perspective, fishermen in Tolosa earn a minimum of P 500 per month, for a total of P 6000 per year. School teachers earn a minimum wage of P 600 per month plus living allowances. In contrast, cane workers earn only P 8 to 10 a day. If they are lucky enough to work the whole year, say 300 days, they will earn P 3000 for the year. The A.I.D. Mission's Country Development Strategy Statement for FY 1982 provides a profile of the poor by occupation. Using this information we find that very few fishermen, small tenant farmers, landless laborers (primarily cane workers) and some semi-skilled factory workers can afford electricity in their homes. The adopters of electricity are larger tenants and landowning farmers, shopkeepers, mechanics, administrative employees, i.e., those with skills and education. Using 1975 income distribution data prepared by the National Economic Development Administration, we estimate that approximately 40 percent of the Filipino rural poor are not able to afford power under current rate levels and tariff structures.

The major obstacle to the adoption of electricity by poor people is the initial cost connected with housewiring which ranges from P 150 to P 250 of which P 50 to P 100 is labor and the balance materials.

This provides one or two bulb sockets and an outlet. Even those cooperatives with a housewiring loan program require payment of labor costs by the homeowner. A family earning only P 10 a day has little chance to accumulate P 50 to P 100. Additionally, many of these poor people cannot be sure that they will earn tommorrow what they have earned today. They are, therefore, reluctant to borrow for housewiring. In any event, housewiring loan terms are not especially liberal, often allowing only a ninety day grace period and requiring repayment in three equal monthly installments. A few cooperatives allow up to one year and charge a low interest, but in general the cooperatives that tried this approach had collection problems and have tightened or terminated their programs.

Distance from the power line is another major inhibition to electrical connections by both the poorer and better-off families. All but one cooperative visited by the team charge a premium of some sort for houses beyond a certain distance from the line. This cost mounts rapidly and the team found few houses hooked up beyond the minimum distance. Typically, the distances beyond which charges are incurred are 30 or 45 meters and the charges range from P 2.00 to P 4.00 per meter. Technically, a house a half kilometer from the line can be hooked up. In practice few houses beyond the minimum distance can afford the cost of a connection.

3. Impact On the Lives of the Poor

Most of the poor are unable to make productive use of electricity. A great many are people struggling for survival. They either cannot afford to hook up or, if they can afford to wire their houses, they cannot afford to use the power productively. For such individuals, electricity ranks fairly low in their preferences. When asked what they would do if they came into some money, responses focused on essentials such as food, clothing and improved housing. For this group of people the only possibility of deriving benefits from electrification is indirectly through the use of electricity to create job opportunities, to improve community life and to improve social services. The existence of such possibilities depends largely on the role of electricity in overall economic development.

Francisco, a 53-year old fisherman of Barrio Salong, Calaca, Batangas, is among the rural poor who have not benefited from electricity at all. He has a low income which he shares with his son who left school to work as a fisherman. Few houses in the barrio have electricity and there are no street lights. Asked what he would do with a windfall of P 500, Francisco replied without hesitation that he would put most of it in the bank to earn interest and he would buy more food.

Other cases, however, exemplify a variety of indirect social benefits. Universally people stated that they felt safer as a result of streetlighting and houses being lit. Many, including policemen, stated the belief that crime has decreased. Electrified barrios often light their meeting hall and multipurpose pavement area, permitting night basketball and well-lit fiestas. Many of those interviewed stated that electrification has stimulated social activities. Father Lipate, a priest in Calaca, pointed out that electricity permits night services, meetings and festivals at his church. Franco, a new entrepreneur in Lemery, said his poor kin come to his house to watch television and get ice from his refrigerator.

One step up from the very poor are those who can afford to wire their houses but can afford little more. This group, of course, obtains the same indirect benefits as those who do not have electricity in their homes. They also can afford to light their homes with electricity. The minimum cost of kerosene lighting appears to be P.50 per night with most interviewees indicating an expenditure of P 1.00 per night. Most cooperatives charge residential consumers for a minimum amount of power, whether consumed or not, usually 10 to 14 KWH per month. Depending on the cost per kilowatt-hour, the minimum bill can run from P 3.60 to P 15.00 per month. With the very minimum cost of kerosene being P 15.00, only in those self-generating cooperatives with power costs in excess of P 1.00 per KWH, can a family light their house for the same or less with kerosene. NEA estimates that 40% of all customers are minimum power users. Of course, as fuel costs rise and rates are adjusted, families who could afford electricity may be forced to discontinue service. This was seen in the oldest cooperative, VRESCO, where an average rate of P 1.05 per KWH has resulted in some 3,000 customers being disconnected for non-payment.

Few users of electricity for lighting emphasize the savings benefit. It appears that these savings are used primarily to increase the purchases of essentials. Convenience is the benefit from electricity most often cited by this group. Those of us who have not lived with the dirt, smell and danger of kerosene can only partly appreciate the remark of the tenant farmer from Camarines Norte who observed that with electric lights "you don't wake up with a nose full of soot." Electric lights also extend the evening hours for many people. Though people are more likely to visit more often and stay up longer, these added hours are generally not used productively. Few people say their children study longer under electric lights.

Within the larger group defined as the poor there is a group which can accumulate the savings necessary to purchase appliances and tools, some of whom have the skills to use them for productive purposes. For this group, electricity can both enhance the quality of life and provide an opportunity for increased incomes. Few people have electric irons because they are too expensive, and no one uses electricity for cooking because other fuels are readily available and cheaper. There is little evidence of appliances being shared among neighbors. Most are content with the leisure activities that electricity enhances. In many cases the first appliance a family buys is a radio or stereo. A refrigerator eliminates the burden of having to buy ice and market frequently. Catalina, a fishmonger in the Calaca market, said her electric iron is much less demanding to use than her old charcoal iron when she returned home tired from the market.

There are cases of households in this group with sufficient skills and capital to more fully utilize electricity in their homes for productive purposes. Augusto was able to move his radio repair operation to his house in Cabatuan, Dulag, Leyte, when it was electrified. He supplements his income working as an electrician for two rock combos. Their eldest son has been trained as a lineman and works for the cooperative. Two women reported they could crochet and embroider more by working at night. Refrigerators were used to produce ice and ice candy and a small fee can be charged for watching television.

Some of the cases in this group indicate that the income benefits of electrification have a bearing on patterns of upward socio-economic mobility. Under certain circumstances, the use of electric power can combine with other factors and assist families to break out of the poverty cycle. Two specific patterns emerge from the interviews. Some families increase their incomes to educate their children who they hope can move out of the poverty cycle. In these cases it is often the wife who uses electricity and any other opportunity available to earn extra income in order to keep a child in school. Corozon, wife of a coconut tenant, had electricity in her home so her children could study at night and she planned to electrify her sari-sari store to improve business. She was selling ice candy made by someone else and wanted a refrigerator of her own so she would not have to share the profits.

There were also cases that illustrate a second pattern in which individuals through their own efforts are in the process of working themselves out of poverty into the middle class using electricity in their entrepreneurial activities. In these cases the individuals have non-farm experience outside their birth places. They are keen at perceiving opportunities for gain and they are willing and able to take the risks inherent in investment. For example, Franco, launched a rice milling business, after working in Manila. Andres, 27, was born in Manila and worked in his father's vehicle repair shop. At 18 he began doing contract work on his own. He moved to his wife's barrio, Cabusay, Labo, Camarines Norte, where he continues doing contract work and has opened a small sari-sari store. With the electrification of his barrio, he now plans to open a body shop next to his home.

III. Conclusions

A. Rural Electricity and Economic Development

The introduction of electricity into an area does not automatically produce significant economic diversification and growth. The contribution of electricity to the development process depends on the level of development of the area, the availability of capital and other financial and human resources as well as the implementation of programs which stimulate the use of power. Of the complementary inputs required to stimulate power-based industrial investment, the availability of start-up capital is critical. The reliability of power is also critical to electricity-based private sector industrial investment decisions.

B. Rural Electricity and the Poor

Electricity does not directly meet a basic human need. It can be an important element in the development process which may help the poor if the process itself is directed toward helping the poor. Lighting the homes of the poor does not have much impact on their lives. They are certainly more comfortable and their lives are more pleasant, but even the poor do not view this as an adequate incentive to choose electricity over other basic needs. If increased comfort and convenience of electric light for the poor is the objective of the rural electrification program, then the project must contain an active housewiring loan program that finances all connection costs over a long enough repayment period that monthly installments will approximate the savings on the cost of lighting.

C. Cooperatives

In choosing the type of organization to be used in distributing power, priority should not be given to cooperatives based on their theoretically democratic nature. In judging what form of organization to use, planners should give preference to effective management. Achievement of objectives such as popular participation by an organization is conditioned by history, culture and political climate rather than by the goods or service with which the organization deals.

D. Financial Viability of Rural Electric Systems

Financial viability depends on rate setting practices, composition of the market, and the number of customers per kilometer of line. Rising energy costs require timely tariff adjustments if the organization's financial integrity is to be preserved without subsidies. Expansion of the system into far flung rural areas on a financially sound basis requires a market with a sufficient number of industrial consumers and/or densely concentrated residential consumers.

E. Energy

While the number of residential consumers of electricity in a rural system is likely to grow rapidly, the additional demand for energy by those customers is likely to remain relatively small because the bulk of their initial consumption substitutes for the use of other fuels. Rural industrial demand for electricity will depend on a government's policies regarding the pricing of power, the pattern of public investment other than in electricity, the availability of capital and other complex factors. Electricity is only one form of energy available for use in rural areas. Careful study is required to learn more about the role of energy in rural development and the criteria for matching energy sources to end-uses.

IV. Program Implications for A.I.D.

Electric, like all forms of energy, is an intermediate product which must be combined with other resources to have an impact on development. Accordingly, electrification alone will not produce sufficient economic growth or social change to justify the investment. Additionally, rural electrification will not have an impact on the lives of the poor unless it affects the development process and that process is, itself, directed toward the poor.

A rural electrification project of an appropriate size and design may have an impact if it: (1) incorporates the additional resources needed to ensure the utilization of electricity; (2) is closely linked to other projects in the same area; and/or (3) is introduced in an area that has reached a level of development which will ensure the presence of adequate resources at the local level. The initial size and subsequent rate of expansion of such a project would have to be calculated carefully to ensure that the process of system expansion does not run beyond the resources to use the energy or, even worse, cause a diversion of human and financial resources from other important developmental activities.

Future studies and evaluations of rural electrification should focus on these broader issues, especially the role of energy, including electricity, in rural development and the identification of the preexisting conditions and complementary programs which will ensure that rural electricity has a positive impact. The opportunity presented by the Philippines, with its widespread rural power base and future emphasis on employment creation, should not be overlooked.

Expectations regarding the rate of progress in constructing rural electric distribution and transmission systems should not be as high as they are in the Philippines unless the factors which have lead to rapid physical progress in the Philippines can be replicated. The success of the Philippines program in meeting its physical targets appears to be due to: (1) a very strong political commitment on the part of the central government which ensures that adequate financial and human resources are available to the implementing organizations; and (2) a relatively well-educated population which enables the implementing organizations to recruit high-quality personnel at all levels.

Given the complexity of designing a rural electrification project which will have the impact A.I.D. seeks, the team recommends cautious and careful study before programming funds for rural electrification. The availability of alternative projects, the desire and commitment of the host country and other country-specific factors should affect the Agency's decision.

APPENDIX A

METHODOLOGY

Methodology

The AID/W evaluation team included a project development officer, an economist, an anthropologist and a political scientist. In addition, there were two Filipino team members, who were social scientists with field interview experience.

The bibliography (Annex E) lists the literature on rural electrification and on the Philippine setting that was reviewed prior to the mission. The team also held a series of interviews in Washington to gain additional background information and to develop our scope of work. Interviewees included AID staff previously associated with the project, NRECA personnel, U.S. Census Bureau staff involved in the NEA's survey of power use and experts on rural electrification in other institutions (e.g., IBRD, Resources For the Future). It was agreed that the team should investigate two issues: (1) whether the benefits of rural electrification have reached the rural poor; (2) the degree to which the cooperative form of organization has stimulated development.

The team spent three days in Manila with the AID Mission and NEA staff. NEA provded an overview of the electrification's objectives and progress to date, as well as detailed information on NEA's and the cooperatives' methods of operation. The NEA also provided us with background material on the areas that we were considering for field work. The Mission provided additional information on the different regions in the Philippines to help us select the areas to be visited. During our stay in Manila, the Mission scheduled a seminar by Rev. Francis Madigan of Xavier University and Alexander Herrin of the University of the Philippines on their A.I.D.-funded research projects to analyze the impact of rural electrification in Misamis Oriental (Mindanao), which was one of the locations of the rural electrification pilot projects in the 1960s.

The team concluded that it would be necessary to spend three to four days in a given cooperative's service area in order to get a reasonably complete picture of the use and impact of electricity. We agreed to visit two cooperatives as a single team in order to refine our research approach and to familiarize ourselves with each other's areas of inquiry. We felt that it would be possible to split the team thereafter, to increase geographic coverage.

A random selection procedure would not be appropriate for such a small number of sites. Accordingly, we decided to seek a range of conditions in the variables that our preliminary work suggested to be the important determinants of the extent and pattern of electrification benefits. The major factors considered in our initial screening were length of service and distribution of power use among residential and non-residential customers. We restricted our selection to cooperatives that had been energized at least four to five years. This length of service seemed to be a reasonable time period over which one might expect to see a significant impact on an electrified community. Moreover, the continuing expansion of coverage in these older cooperatives would provide ample opportunities for examining individual barrios in which electrification was more recent. The composition of power use was the second criterion of selection; the objective was to choose cooperatives with the full range of consumers -- residential, commercial, industrial, irrigation, public buildings and street lights -- so that we would be assured of an opportunity to investigate all the possible channels of electrification's impact on development and poverty.

Beyond these two criteria we sought the following characteristics in the cooperatives on our itinerary: (1) a range of rate levels; (2) examples of self-generating cooperatives and distribution-only cooperatives; (3) service areas with a high incidence of poverty, as indicated by the Mission's FY 1982 CDSS; (4) service areas offering agricultural activities of major importance to the Philippines (e.g., rice, sugar and coconuts); (5) geographic dispersion among the country's major island groups. These selection criteria plus logistical considerations resulted in the following list of sites for intensive examination:

-- Batangas Electric Cooperative (BATELEC I), Calaca, Batangas Province

-- Camarines Norte Rural Electric Cooperative (CANORECO) Daet, Camarines Norte Province

-- Victorias, Manapla, Cadiz Electric Cooperative (VRESCO), Manapla, Negros Occidential Province

-- Central Negros Electric Coopertive (CENECTO), Bacolod City, Negros Occidential Province

-- Don Orestes Romualdez Electric Cooperative (DORELCO), Tolosa, Leyte Province

In addition, our schedule permitted us brief visits to two cooperatives:

-- Camarines Sur II Electric Cooperative (CASURECO II), Naga City, Camarines Sur Province

-- Leyte II Electric Cooperative (LEYECO II), Tacloban City, Leyte Province

At the site of each intensive visit, our procedure was to start with a half-day orientation and series of interviews with the cooperative management and staff. In addition to a basic progress report on the cooperative's activities, these sessions provided information on the variety of economic activities and conditions in the service area, which was useful in our selection of barrios for our impact interviews. Individual team members also interviewed key staff at each cooperative's headquarters (General Manager, Office Manager, Chief Accountant, Member Services Chief, engineers, linemen, etc.) to enable us to evaluate the cooperative's efficiency, financial viability, membership participation, major problems and future plans. The balance of our visit in the service area was spent interviewing people in the poblaciones and barrios. We did not conduct our interviews as part of a survey with random selection of respondents; we actively sought certain types of interviewees that would enable us to obtain the maximum range of information during our relatively short stays in each area. We made attempts in each barrio to interview businessmen in electric-using enterprises, the school director, health personnel, the parish priest, municipal officials, members of the cooperative's board of directors, rural bankers and shopkeepers. In addition, we held interviews with individual farmers (both landowners and tenants), farm laborers, fishermen, carpenters and casual workers. In all locations we interviewed both adopters of electricity and non-adopters. The interviews were relatively unstructured but intensive, usually taking more than an hour each. The objective of the interviews was to understand the conditions of rural life for the interviewee, how that individual responded to the introduction of electricity in the area and what that individual perceived to be the effects of electrification upon himself or herself and upon the community.

After the field interviews, the team returned to Manila for discussion of our preliminary findings with the AID Mission and NEA staff. NEA also provided additional data that had been unavailable in the field.

APPENDIX B

ENERGY IMPACT

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Energy Impact

Total commercial energy consumption in the Philippines was 93 million barrels of oil equivalent (MMB) in 1979, of which 28 MMB were consumed by the power sector. Approximately 80 percent of the Philippines' energy needs are being met by imported oil. It is expected that total energy demand will increase to 192 MMB by 1988 and that electric power demand will increase to 76 MMB. In per capita terms, energy use will increase from two barrels per year in 1979 to 3.4 barrels per year in 1988. By way of comparison, Korea's per capita energy consumption is 5.3 barrels and U.S. consumption is 57 barrels per person. The sectoral distribution of energy use will shift in favor of industrial users of energy and, to a lesser extent, residential consumers.

Projected Energy Consumption

		1979	1983	1988
Total Consumption (MMB)		93.2	129.0	192.1
of which:	Residential	14.4%	15.0%	15.0%
	Commerical	8.4%	9.0%	9.0%
	Industrial	41.8%	43.0%	45.0%
	Transportation	35.4%	33.0%	31.0%

Within the category of residential consumers, it would appear that most of the growth in demand will be related to the rural electrification efforts. Private utilities are expected to increase connections from the current 1,349,000 in 1978 to 1,892,300 in 1988, while the cooperatives are planning to increase connections from the current 1,159,434 to 5,549,000 by 1988. In geographic terms, the growth rate of electrification will be greater in Mindanao and the Visayas than on Luzon.

The very ambitious household electrification targets do not translate into a substantial increase in the residential sector's overall share in demand for power because rural consumers adopt electricity primarily as a substitute for kerosene lighting and to operate relatively low power-drawing appliances such as radios. In fact forty percent of cooperative customers are minimum users of electricity (i.e., less than 15 KWH per month). At this stage in the rural electrification program, there is no evidence that rural Filipinos are becoming "electricity junkies."

In 1979 total energy use by the power sector amounted to 13,320 gigawatt-hours (GWH), of which the cooperatives' demand accounted for 1,254 GWH (9.4%). Between 1979 and 1990, national power requirements are expected to increase at a rate of 9% per annum. Cooperative consumers' electricity use, on the other hand, is projected to grow by nearly 14% per year, which means that the cooperatives' customers would be consuming 5,125 GWH in 1990 (14.8% of national electricity consumption).

The fuel diversification effort in the Philippines will be the major determinant of whether the growth in energy use leads to balance of

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payments difficulties. The most promising alternative fuel sources for generating central grid power are hydro and geothermal. The Philippines has harnessed only 4.4 million barrels of-oil-equivalent of hydropower out of a potential 50 MMB, and efforts have just begun to tap the country's sizeable geothermal power potential (estimated at 2,300 MMB per year). As the NPC shifts its power sources away from oil and as cooperatives rely increasingly upon centrally generated electricity from NPC grids, rural energy consumption will become less oil-intensive. NEA itself is increasing its involvement in power generation, but its overall contribution is likely to remain relatively small until it completes its distribution system. In the meantime, however, individual cooperatives will be exploring the possibilities of serving some customers with small-scale decentralized power sources (e.g., mini-hydro, biogas) or with power generated by local fuel sources (e.g., dendro-thermal).

In light of these diversification policies, the GOP's Ten Year Energy Program for 1979-88 envisions that the power sector's reliance on oil will decline from 75.8% to 31.2%. In addition, the oil that is burned will be obtained increasingly from domestic sources; the imported component of Philippine oil consumption is expected to drop from 88.2% in 1979 to 64.1% in 1988. Combining these trends, one can calculate the percentage of the power sector's energy use that will be met from imported oil. These figures, in turn, can be applied to rural consumers' expected power consumption to get a rough estimate of the demand for imported oil that is attributable to the rural electrification program. The following table indicates that the growth in rural consumption of electricity is expected to be more than offset by the growth of non-oil energy sources and domestic sources of oil. Rural consumption of electricity required approximately 1.7 million barrels of imported oil in 1979 and will require roughly 1.4 million barrels in 1988. These estimates are back-of-the-envelope calculations, based on the assumption that the Philippines will meet its ambitious energy diversification goals. Even with a substantial margin of error, however, these figures support the conclusion that the rural electrification program is not likely to trigger a serious balance of payments problem during the next decade.

Imported Oil for Rural Power

	1979	1983	1988
Rural Power Consumption	2.6 MMB	4.3 MMB	7.2 MMB
Share of Oil in Power Sector Energy Use	.758	.572	.312
Imported Oil Share of Total Oil Use	.882	.756	.641
Imported Oil Intensity of Power Sector	.669	.432	.200
Imported Oil Use Attributable to Rural Consumers of Electricity	1.7 MMB	1.9 MMB	1.4 MMB

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The fundamental development issue relating to the impact of rural electrification upon aggregate energy consumption is whether energy use conforms to the real resource cost to society of providing a given level and distribution of power to rural areas. In the case of rural electrification in the Philippines, the failure of the cooperatives to pass through the full costs of power (which includes the cost of repaying the NEA construction loans) means that the NEA is subsidizing power use. Society, therefore, is using more electricity than it would under a rule of efficient resource allocation, and rural development will tend to be more energy-intensive than is appropriate for the Philippines' relative factor endowments. While the direction of bias in energy pricing is clear, the magnitude of that bias and of the associated misallocation of resources (especially labor) can be determined only through additional research.

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APPENDIX C

RURAL ELECTRIFICATION COOPERATIVES AS DEVELOPMENT INSTITUTIONS

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Rural Electrification Cooperatives as Development Institutions

> "The beneficiaries of the project---the farmers, the barrio dwellers, the rural people---gain useful social and political experience by organizing themselves into electric cooperatives....
>
> The electric cooperative, since it laces together all the social and economic levels of the community, also acts as a 'watering place', or medium, for exchange of ideas leading toward further community efforts...."

Capital Assistance Project Paper
Philippines - Rural Electrification II
AID-DLC/P-2053, June 14, 1974

The objective of rural peoples' participation in this developmental intervention went largely unachieved. As reflected in the composition of the cooperative boards of directors, in the meetings and elections designed to tie them to their members, and in the general process of decision making which characterizes the cooperatives, membership involvement is beside the point.

The members largely function as a mute market for electric service, no more no less. This lack of popular participation is in part reflected in the occupational composition of the boards of directors for the cooperatives visited. Of the 46 board positions, 12 were businessmen, 19-21 were government employees (some listing more than one occupation); 10 were farmers; and 8-10 were professionals, lawyers or CPAs. All of those listing themselves as farmers were described as sugar planters, a sector dominated by large landholders. There were no urban workers, no rural laborers, no small farmers, 5 teachers (4 from Leyte) on the boards. The boards clearly drew disproportionately from local leaders in government and business.

Meetings and elections designed to reflect the general membership's opinions are structured to minimize their impact. Often such meetings are not held at all. At CANORECO there have been no elections or general meetings since the interim board of directors was installed in 1975. CENECO simply limits its membership to those who have participated in a pre-membership seminar which is held once or twice a week, limited to around 50 participants and conducted by the president of the board. This provides an opportunity to screen potential voting members. To date only 3,003 of CENECO's 29,022 consumers are members of the cooperative. Where annual general meetings are held, they are used to present the cooperative management's views to those who come. The size of attendance is directly related to whether the cooperative provides food, transport and a raffle.

In the few cases we found of resolutions being introduced by members at such annual meetings, we also found the board circumventing them. At BATALEC, for example, the annual membership meeting passed a resolution banning bulk users from representation on the board. The board defined a bulk user as one who used 10,000 KWH of electricity, which did not affect anyone on the board.

A similar lack of participation was found at the district level of the cooperatives. Each board member is supposed to be elected by and represent a specific district. A district electrification committee consisting of representatives from eight sectors (youth, civic organizations, farmers, etc.) is designed to advise the director on his community's wishes. We found no evidence of activity on the part of these committees. We found few, if any, members who could identify their board member. We found no district level meetings held for purposes other than elections of board members and the committee. This lack of popular participation results in popular apathy toward cooperative activities and fear of local political influence on the part of NEA and those involved in the management of the cooperative. As one leader put it, "if someone representing the community were elected, he might not understand electricity and things would not run smoothly."

This fear of local politicians was voiced repeatedly by board members and managers. Clearly, local politicians see electricity as a desirable resource to be brought under their influence. The conflict between cooperative/NEA management and local political forces can be seen in CASURECO II. The interim board there had been in office since August, 1975. It required a strong locally led dissident group, a court order and a push from President Marcos to bring about election of board members. Even with the pressure, NEA and the cooperative deferred the election from January until April in order to give incumbent directors time to prepare and campaign which in this case did not prevent most of them from losing the election.

The political dynamic then is between a managerial group under fairly strong central control and local political groups. Within the overall national plan for electrification, the competition is over who will get electricity, when and for how much. While there is some trading off to accommodate local pressures, the general pattern appears to be the allocation and pricing of power in accordance with overall national policy as established in Manila.

APPENDIX D

THE FINANCIAL VIABILITY OF RURAL ELECTRIFICATION COOPERATIVES

[redacted]

The Financial Viability of Rural Electrification Cooperatives

The project envisions the cooperatives evolving into financially sound entities capable of generating adequate revenue to cover operating costs, construction loan amortization and a reinvestment reserve amounting to two to five percent of gross annual revenue. The terms of the NEA loans (five-year grace on interest and principal, thirty year amortization period)[1] require the cooperatives to increase their gross margins (profits) gradually during years two through five to the point that in the sixth year they can meet their loan repayment schedules. Of the thirty-eight cooperatives that have entered the amortization period, 8 are current in their loan repayments, 18 have made advanced payments in response to NEA encouragement and 12 are delinquent.

Cooperative delinquency is attributable to two policies. First, both the NEA and the local management of the cooperatives are seeking to maintain some degree of socialized pricing of electricity in the face of rapidly increasing costs of purchased/generated power. In its rate reviews NEA is more prone to make downward than upward corrections in cooperatives' rate adjustment proposals. Local managers and boards share the NEA's low rate philosophy. Accordingly, many cooperatives have resisted raising their rates promptly enough to cover increasing power costs and to generate adequate surpluses for loan repayment. Public sentiment in the cooperative area reinforces this aversion to rate increases; in the case of CASURECO II, for example, dissatisfaction with a proposed rate increase was a contributing factor to the defeat of several board members in an election held in April.

The second policy that threatens the financial viability of some cooperatives is the full-speed-ahead expansion of coverage that is mandated by NEA in the form of construction targets for each cooperative. The determination by NEA of each cooperative's expansion rate has served to accelerate the overall electrification program, but the immediate pressure to expand rapidly has caused many cooperatives to postpone the establishment of an adequate sinking fund in favor of increased construction expenditures.[2] The rapid expansion policy also has weakened some cooperative's financial base because the provision of electricity in more sparsely populated areas increases sharply construction, operations and maintenance costs of providing electric service.

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[1] Terms refer to NEA loans to distribution cooperatives; self-generating cooperatives receive two percent interest and thirty five year amortization period beyond the five-year grace period.

[2] As of February 1980, 21 of 96 reporting cooperatives has established sinking funds. CENECO and CASURECO II had the largest funds amounting to P 1.8 and P 1.0 million respectively. The remaining 19 sinking funds averages P 168,000.

Most of the NEA construction loans to the cooperatives will begin to mature in the next three years, and the NEA's own repayment obligations will increase sharply in 1983. To date the more solvent cooperatives have been able to generate sufficient surpluses to cover the delinquencies, and indeed the NEA has encouraged the financially stronger cooperatives to make advance loan repayments. CASURECO II, for example, made a P 500,000 advance payment in 1979, and BATELEC I made a P 200,000 advance payment in March, 1980. As the NEA's debt service burden increases, however, the option of relying on the surpluses of a few strong cooperatives will disappear. Steps will have to be taken to improve the financial strength of the majority of cooperatives and this may necessitate upward rate adjustments, a slowdown in the rate of the system's expansion, or rescheduling of both the cooperatives' and NEA's debts.

Two countervailing factors may improve the financial health of the cooperatives. First, some of the self-generating cooperatives will be able to switch from costly local sources of power (e.g. diesel generators) to more reliable and efficient power from a central grid (e.g. Leyte-Samar) or to cheaper forms of locally generated power (e.g. mini-hydro and dendro-thermal). To the extent that these alternative power sources reduce the upward pressure on cooperative power costs, the cooperative should be in a better position to allocate funds for loan amortization.

Second, the establishment of a larger industry in a cooperative's service area can improve the cooperative's financial situation very quickly. Although the cost of serving big users of power is lower than the cost of serving several hundred households with the same aggregate power consumption, cooperatives typically collect the same amount per kilowatthour from industrial users as they collect from residential consumers. In order to increase the industrial sector's contribution to the financial health of the cooperatives, the NEA and the National Power Cooperation (NPC) are modifying their policies on direct industrial connections to the NPC transmission lines. The new policy will permit direct connections to NPC lines only if the industrial consumer pays royalties to the local cooperative in recognition of the cooperative's franchise privileges. In addition, the GOP's development plan calls for a dispersion of large- and medium-scale industries throughout the provinces. If the geographic dispersion policy succeeds, cooperatives will have more industrial consumers to offset some of the high costs of serving households in the far-flung barrios.

While the practice of subsidizing rural household coverage at the expense of industrial consumers bolsters the financial condition of household-oriented electrification cooperatives, it raises broader development questions about the tradeoff between maximizing household connections and improving the incentives for industrial investment in rural areas. The team was unable to to determine if closer adherence to marginal cost pricing of electricity among consumer classes would have improved significantly the industrial investment response

[redacted]

to rural electrification.

Collection performance varies widely among the cooperatives; for example, DORELCO reported a collection ratio (percentage of billings collected within thirty days) of 72 percent while CANORECO reported 88 percent. Most of the cooperatives' performances fall within this range. Clearly, a first step in improving many cooperatives' financial conditions is to improve collection efficiency, specifically by raising collection rates to the NEA target of 90 percent.

Finally, it should be noted that the NEA exercises very close supervision of the cooperatives' financial condition. Monthly reporting is comprehensive and is supplemented by audits and frequent visits by NEA personnel. NEA also places its own employees as general managers in cooperatives having financial difficulties and provides training for cooperative employees involved in financial matters.

APPENDIX E

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APPENDIX F

STATISTICAL DATA ON COOPERATIVES

COOP GENERAL STATISTICS

1979

	BATELEC I	CANORECO	CASURECO II[3]	DORELCO	VRESCO	CENECO
Total KWH Purchased	22,279,215	10,400,175	26,665,344	0		0
Total KWH Generated	0	84,322	0	15,805,096		95,361,707
Total KWH Available	22,279,215	10,484,497	26,665,344	15,805,096	15,620,320	95,361,707
Disposition of Power (%)	100.00	100,00	100.00	100.00	100.00	100.00
-- Residential Sales	38.54	32.33		11.47	28.30	31.71
-- Commercial Sales	7.82	16.63		1.22	10.61	12.23
-- Industrial Sales	30.99	13.56		1.96	28.69	22.69
-- Public Buildings Sales	1.51	2.39		.48	.52	3.38
-- Street Lighting	3.01	4.07		1.43	3.94	1.06
-- Communal Water	.62	0		0	0	0
-- Irrigation	.01	0		0	7.88	0
-- Other Sales	.16	.04		65.56	3.83	9.49
-- Used By Coop	.30	2.09	.29	4.05	3.31	4.30
-- System Loss	17.04	28.89	25.07	13.83	12.92	15.14
Distribution Construction to Date (Dec 31, 1979)						
-- Primary Line Construction (KM)	331	219.6	160	214	551	220
-- Secondary Line Construction (KM)	290	719.0	358	194	375	715
-- Total KVA Installed	11,915			4,635		
-- Total KVA in Service	11,800			4,635		
Potential Household Consumers	49,907	47,388	45,263	45,000	32,983	105,597
Actual Household Consumers	24,083	10,013	15,238	9,286	16,914	25,709
-- Percentage (%)	48.2	21.1	33.7	20.6	51.3	24.35
Coop Members [1]	26,026	11,396	10,873	11,657	18,574	3,003
Other Service Connections [2]	1,786	1,310		390	1,603	3,259
Number of Employees	138	119		138		279
Total Payroll (P 1000)	1,293	906		648		3,924
Number of Connections Served/Employee	187	95		70		104
Average Annual Salary (Pesos)	9,370	7,614		4,696		14,066
Number of Outages During Year	258					
Total Number of Hours of Outages	458			2,160		1,830

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[1] As of December 31, 1979, except in case of DORELCO which is March 31, 1980.
[2] Excludes street lights
[3] As of June 30, 1979. Annual figures for energy are based on average for period July 1, 1977 - June 30, 1979.

COOP FINANCIAL DATA

1979

(Pesos/KWH Sold)

	BATELEC I	CANORECO	CASURECO II[1]	DORELCO	VRESCO	CENECO
Power Cost (Composite)		(.397)			(.600)	
-- Purchased	.298	360	.283	0	N/A	0
-- Generated	0	4.948	0	.563	N/A	.441
Distribution Cost						
-- Operation	.005	.026	.019	.010	.008	.014
-- Maintenance	.015	.048	.039	.008	.018	.004
Consumer Account Expenses	.029	.028	.029	.020	.044	.009
Administrative & General Expenses	.034	.074	.040	.049	.087	.030
TOTAL OPERATING EXPENSES	.381	.573	.410	.652	.757	.498
Operating Revenue	.429	.580	.524	.671	.788	.652
Operating Margin Before Depreciation	.048	.007	.114	.019	.031	.154
Depreciation Amortization and Long-term Interest	.038	.089	.050	.182	.160	.127
NET OPERATING MARGIN (LOSS)	.010	(.082)	.064	(.163)	(.129)	.027

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[1] Refers to financial data covering period July 1, 1978 - June 30, 1979. KWH sold represents annual average based on period July 1, 1977 - June 30, 1979.

N/A - not available

COOP STATEMENT OF OPERATIONS
1979
(Pesos 1,000)

	BATELEC I	CANORECO	CASURECO II[1]	DORELCO	VRESCO	CENECO
Operating Revenue	7,896	4,192	10,433	8,712	10,307	50,097
Less: Operating Expenses						
Power Purchased	5,486	2,587	5,629	0	3,822	0
Generation Expense	0	288	0	7,318	4,034	33,846
Operation Expense	94	189	386	131	104	1,052
Maintenance Expense	272	345	783	101	234	271
Consumer Account Expense	535	201	579	263	582	673
Administrative and General	621	536	788	643	1,142	2,309
TOTAL OPERATING EXPENSE	7,008	4,146	8,165	8,456	9,918	38,151
Operating Margin Before Depreciation & Amortization	888	46	2,268	256	389	11,946
Less: Depreciation, Amortization, Long Term Interest	701	645	999	2,364	2,099	9,770
NET OPERATING MARGIN	187	(599)	1,269	(2,108)	(1,710)	2,176
Non-operating Revenue	281	151	494	43	88	248
Less: Non-operating Expense	126	133	191	55	9	24
NET MARGIN (LOSS)	342	(581)	1,572	(2,120)	(1,631)	2,400
GROSS MARGIN (Operating Revenue Less Power Costs)	2,410	1,317	4,804	1,394	2,451	16,251

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[1] For Fiscal Year July 1, 1978 - June 30, 1979.

COOP BALANCE SHEETS

December 31, 1979
(Pesos 1,000)

	BATELEC I	CANORECO	CASURECO II[3]	DORELCO	VRESCO	CENECO
ASSETS						
Total Net Utility Plant[1]	21,327	13,850	11,868	40,625	22,994	82,074
Other Property and Investments	-	-	-	-	2,500	33
Restricted Funds/Member Dues	570	65	-	17	-	1
Sinking Fund	-	48	1,000	-	-	1,510
Cash - General Fund	714	206	1,312	29	114	1,688
Cash - Loan Fund	0	5	426	12	-	243
Cash - Housewiring Fund	152	94	-	4	-	32
Accounts Receivable						
-- Energy Sales	1,743	481	1,633	2,158	2,785	6,440
-- Housewiring	45	42	158	90	-	-
-- Other	284	1,698	916	2,269	1,077	1,334
Advances to Officers, Employees	25	50	90	82	155	82
Materials Inventory						
-- Distribution	1,163	4,426	1,757	9,362	4,736	8,121
-- Housewiring	25	87	202	43	-	-
-- Other (Including fuel)	25	204	-	1,086	-	1,262
Office Supplies Inventory	39	-	58	3	-	96
Prepayments (Insurance, etc.)	24	47	79	36	82	453
Other Current and Accrued Assets	17	-	138	187	33	326
NEA Loan Available	2,457	5,366	7,546	7,703	25,519	19,146
Other Deferred Debits	470	1,076	295	1,437	1,079	306
TOTAL ASSETS	29,080	27,745	24,485	65,143	61,074	123,147
LIABILITIES						
Long Term Debt						
-- NEA Construction Loan	25,751	25,090	21,481	28,600	27,690	109,879
-- Housewiring Loan	38	132	250	171	-	203
-- Other	116	1,520	-	37,600	27,430	0
Accounts Payable						
-- Fuel and Power	578	553	1,951	361	2,145	2,805
-- Other	0	909	-	744	5,214	1,310
Other Current & Accrued Liabilities	217	0	798	4,161 [2]	8,285	6,150
Deferred Credits	434	535	5	784	560	2,058
TOTAL LIABILITIES	27,134	28,739	24,739	72,421	71,324	122,405
EQUITIES & ACCUMULATED MARGINS	1,946	(994)	2,993	(7,278)	(10,250)	742

[1] Includes utility plant in service and under construction
[2] Includes short-term Provincial Government Loan Fund (Pesos 1,000,000)
[3] As of June 30, 1979.

NATIONAL ELECTRIFICATION ADMINISTRATION
Cash Generation Compared to Debt- Service Requirements

Cash Generation (PM)	1978	1979	1980	1981	1982	1983
Interest from Coops	.9*	21.2	31.2	46.8	70.1	94.9
Income from Other Sources	7.1	8.4	9.9	12.0	14.2	18.0
Sub-Total	8.0	29.6	41.1	58.8	84.3	112.9
Less: Operating Expenses	17.8	21.2	22.7	24.3	26.0	27.8
Cash Operating Income	(9.8)	8.4	18.4	34.5	58.3	85.1
Plus: Depreciation	.9	1.0	1.1	1.2	1.3	1.4
Plus: Principal Repayment	.9*	17.0	26.3	38.2	64.0	88.0
Total Cash Generation	(8.0)	26.4	45.8	73.9	123.6	174.5
Debt Service Requirements (PM)						
Interest Expense and Commitment Charges	17.8	23.4	39.4	58.9	77.5	113.4
Principal Repayments	13.8	12.2	16.1	17.5	18.7	29.2
TOTAL	31.6	35.6	55.5	76.4	96.2	142.6
Debt Service Coverage	(.25)	.74	.83	.97	1.3	1.2

*Actual payments by cooperatives

COOP RATE STRUCTURES

April 1, 1980

(Pesos)

	BATELEC I	CANORECO	CASURECO II	DORELCO	VRESCO	CENECO
Residential Consumer						
-- Minimum Bill (0-10 KWH) 1/	3.60	5.40	6.25	13.10	10.30	4.00
-- Excess (per KWH)	.36	.54	.45	1.31	1.05-1.13	.30-.375
-- Self-generation Surcharge	n/a	.46	n/a	n/a	n/a	n/a
(Revenue/KWH)	(.42)	(.57)		(1.31)	(1.06)	(.73)
Commercial Consumer						
-- Minimum Bill 2/	6.00	11.52	7.20	13.10	10.80	12.50
-- Excess (per KWH)	.40	.576	.48	1.31	1.07-1.15	.512-.225
(Revenue/KWH)	(.47)	(.58)		(1.31)	(1.07)	(.82)
Industrial Consumer						
-- Minimum Bill (demand and energy)	250.00	n/a	n/a	13.10		300.00
-- Demand (per KW)	10.00	9.00	5.50	n/a		12.50
-- Energy charge (per KWH)	.28	.522	.42	1.31		.30-.15
(Revenue/KWH)	(.43)	(.60)		(1.31)	(.79)	(.74)
Public Buildings						
-- Minimum Bill (1-10 KWH) 3/	3.70	5.40	6.25	13.10		
-- Excess (per KWH)	.37	.54	.45	1.31		
(Revenue / KWH)	(.43)	(.58)		(1.31)	(1.00)	(.72)
Street Lights (175 watts)	23.00	28.35	28.00	60.00	63.65	10.00
(Revenue/KWH)	(.35)	(.45)				(.24)
Communal Water System						
-- Demand Charge (per HP)	5.00	n/a	n/a	n/a	n/a	n/a
-- Energy Charge (per KWH)	.28	n/a	n/a	n/a	n/a	n/a
(Revenue/KWH)	(.40)	n/a	n/a	n/a	n/a	n/a
NEA approved Fixed FCA (applied to all classes)	.185	.173	.085	na/		.586
Sales To Other Coops	na/	n/a	n/a	.932-.944	.95	.55
Excess Service Drop	Beyond 45m P 3.00/m	Beyond 30m P 2.05/m	Beyond 30m P 4.20/m	Beyond 30m P 2.05m		
Average Basic Rate (per KWH) 4/	.429	.580	.524	.671	.788	.652

1/ Minimum residential bill refers to 0-15 KWH for CASURECO II and 0-14 KWH for CENECO

2/ Minimum commercial bill applies to 0-15 KWH for BATELEC I, 0-20 KWH for CANORECO, 0-15 KWH for CASURECO II, 0-10 KWH for DORELCO and VRESCO, demand charge of 1 KW for CENECO

3/ Minimum public buildings bill applies to 0-15 KWH for CASURECO II.

4 Average Basic Rate = Operating Revenue ÷ KWH sold. Average Basic Rate will be lower than KWH weighted averages of rates if collection ratio is less than 100%.

n/a - not applicable

APPENDIX G

SOCIO-ECONOMIC CASE STUDIES

[redacted]

Socio-Economic Case Studies

Batangas Province

Case

B. 1. Antonio, a 35-year old truck driver (Calaca)

B. 2. Florente, manager of a farm supply shop (Calaca)

B. 3. Catalina and Felicia, fishmongers in the Calaca market (Calaca)

B. 4. Sixto M., Barrangay Captain and pharmacy-snack shop owner (Calaca)

B. 5. Natalio de Leon's woodcraft shop (Barrio Pagasa, Calaca)

B. 6. Father Lipat, parish priest (Calaca)

B. 7. Sarmiento, elementary school principal (Barrio Santo Tomas, Calaca)

B. 8. Punciana, fisherman's wife (Barrio Salong, Calaca)

B. 9. Gregorio, outrigger (*banca*) builder (Barrio Salong, Calaca)

B. 10. Francisco, B., fisherman (Barrio Salong, Calaca)

B. 11. Franco, Rice Mill owner (Barrio Bocal, Lemery)

B. 12. Vio, Body-shop owner (Lemery)

B. 13. Electric appliance shop (Balayan)

B. 14. Batangas Sugar Central, Inc. (Balayan)

B. 15. Sterling Integrated Ventures Cold Storage (Barrio Gimales, Balayan)

B. 16. Mr. Agenca, Leader in the Barrio Sinisian Water Service Association, (Barrio Sinisian, Lemery)

B. 17. The Don Manuel Lopez Memorial Hospital (Balayan)

Camarines Norte Cases

Case

CN 1. The New Life Ice Plant and Cold Storage. (Mercedes)

CN 2. Bicol Enterprises (Ice Plant and Cold Storage). (Mercedes)

CN 3. Anselmo B., Former Fisherman and Manager of a Dried Fish Business. (Marrio Siete, Mercedes)

CN 4. Andres, Metal Worker and Shop Owner. (Barrio Cabousay, Labo)

CN 5. David, Tenant Farmer. (Barrio Calangkawan, Vinzons)

CN 6. The New Society Lane Group. (Barrio Calangkawan, Vinzons)

CN 7. Corozon, B., Sari-Sari Store Operator and Wife of Tenant Farmer. (Barrio Mampurog, Imelda).

CN 8. Julio, A Young Coconut Tenant Farmer. (Barrio Mampurog, Imelda)

CN 9. Ludvicio, Coconut Tenant Farmer. (Barrio Mampurog, Imelda)

CN 10. Bienvenido Somoza, Furniture Maker (Vinzons)

CN 11. Armando Alap's Metalcraft Shop. (Vinzons)

CN 12. Jose Balce, Rice Mill Owner. (Vinzons)

CN 13. A. R. Rasco, Rice Mill Owner. (Vinzons)

CN 14. The J. R. Bardon Rice Mill. (Vinzons)

CN 15. Armando Malaca, Farm (Paddy) Laborer. (Vinzons)

CN 16. Jose Gasa, Coconut Farmer. (Barrio Dagototan, Imelda)

CN 17. Reynaldo Nano, President of a BLISS Settlement. (Daet)

CN 18. Angelita Oga, Wife of a Coconut Laborer. (Barrio Mampora, Imelda)

CN 19. Ramon Ebona, Mechanic/Electrician and Coconut Tenant. (Barrio Mampora, Imelda)

Leyte Province Cases

L. 1. Fidel Dagami, Supervisor of the Tanauan School of Craftsmanship and Home Industry. (Tanauan)

L. 2. Evilia Martin, Chief of the Leyte Provincial Development Staff (Tacloban)

L. 3. Sam's Welding Shop (Dulag)

L. 4. The National Industrial Development Corporation (NIDC) Oil Mills, Inc. (Tanauan)

L. 5. The Pepsi-Cola Bottling Plant (Tanauan)

L. 6. Manuel Caetano, Barangay Captain and Small Farmer (Owner) (Barrio Alegre, Dulag)

L. 7. Billy and Bonifacio, Fishmongers (Julita)

L. 8. Cecilio, Owner of a Small Restaurant (Julita)

L. 9. Andres Acero, Laborer (Barrio Cabatuan, Dulag)

L. 10. Augusto, Radio Repairman (Barrio Cabatuan, Dulag)

L. 11. Santiago Piamonte, Fisherman/Farmer (Barrio San Jose, Dulag)

L. 12. Sylvia Lopera, Acting Manager of a Rural Bank (Tanauan)

L. 13. Father Penaranda, Parish Priest (Dulag)

L. 14. The Pang Sisters, Entrepreneurs (Dulag)

L. 15. Pacifico V., Fisherman/Small Landowner (Barrio San Jose, Dulag)

BATANGAS CASES

B. 1. Antonio, Truck Driver

Antonio, 35 years old, has a modest house (of wood construction) surrounded by a small grove of trees and garden located not far from the Batelec II Coop along the main street in Calaca, Batangas Province. He had worked as a jeepney driver, and in early 1979 his brother, an employee in a Manila cigar factory (La Suerte), obtained a job for him as a truck driver for the firm. Antonio now remains in Manila for several weeks, and then returns home to Calaca for several days with his family. His wife cares for the household, and all of their five children are in school (Antonio expressed the hope that they would be able to complete college). The children are responsible for maintaining the kitchen garden that supplies the family table with tomatoes and eggplants, while the grove produces bananas, calamansi (small oranges), guava, coconuts, and mangoes, some of which can be sold.

Late in 1974, when the new Batelec II Coop began to electrify Calaca (first with streetlights), Antonio's house was selected to be the "model" residence--i.e., the first to be connected. Prior to that, the small main room of the house was lit by a Coleman lamp while the kitchen and bedroom were illuminated by kerosene lamps. Cooking was done using firewood. The manager of the coop approached Antonio, proposing that his house be the model with a fluorescent light in the main room, a bulb in the kitchen, and a small light outside the front door (which is seldom used). Installation would be free, but Antonio would have to pay the monthly fee. Antonio agreed, and the house was connected. The immediate effect was that his house became a community curiosity, with friends and townspeople coming around to find out how he and his family liked this innovation. Antonio and his wife told them that the electricity was less expensive than kerosene, and the need to clean lamps was eliminated. They found that whereas previously they usually went to bed around 7:00 p.m., they now were remaining up with visitors until midnight. Soon, many of their neighbors were requesting connections from the coop. The only appliance that Antonio and his wife have purchased is an electric iron, which is a great deal more convenient than the charcoal iron. Although they now buy butane gas for cooking, they still feel that Antonio's increased income is not sufficient for them to buy a television set.

Antonio is a member of the coop although he never attends any of their meetings. The coop is responsible for the lines up to the house connection, so when the system within the house needs repair, Antonio must hire one of the local electricians, who were trained by the coop as linemen and technicians and who take private jobs during their off-time.

B. 2. Florente, Manager of a Farm Supply Store.

On the main street of Calaca a small, neat store has a large sign announcing the sale of "Planters Products," a well-known and relatively expensive line of farm supplies. Inside there were sacks of chemical fertilizer, containers of butane gas, cans of pesticide, sprayers, machetes, and bottles of cooking oil. The manager of the store is Florente, 30 years of age, and a kinsman of Natalio de Leon, who owns the business (he also owns the new ice plant and a wood-working shop described in Case B.5.). Most of the customers are tenants of the de Leon family who farm sugar cane for the most part. They come to the shop to buy seeds on credit, repaying in kind after their harvest. Florente noted that agricultural production in the vicinity has been increasing, a development which he attributed to the widespread use of chemical fertilizer. The increased production has been reflected in rising sales of Calaca shops. Another factor has been the use of electricity to light the shops and market. Businesses are open until 10:00 p.m., allowing those from the surrounding area to shop later in town. Florente expressed the opinion that electricity has "enlivened" the downtown of Calaca with public gatherings, concerts, and a basketball league on the plaza. New shops and stalls have opened in the vicinity of the market.

B. 3. Catalina and Felicia, Fishmongers in the Calaca Market.

In the Calaca market the fish section has a roof but no walls, and it is surrounded by small stalls. Standing behind their counter of small fresh and dried fish (delice), stout and smiling Catalina (in her 50's) and her younger colleague, Felicia (in her mid-20's) constantly whisked the flies away from their wares. Catalina is a widow with seven children, all of whom are grown (four are married), and four of them (the three single children and one married daughter) share her house. Felicia has a husband and two small children. Prior to the installation of Batelec I Coop power, the market was lit by Patromax (Coleman) lamps with small kerosene lamps (kinky) in the stalls. The cost of the electricity is included in the rental fee for space--P 60 per day for the outside stalls and 25 centavos a day for space in the market shed. The electric lights are a convenience, but Catalina, complaining that there are too many outages, pointed up to the dusty Petromax lamp still hanging from a rafter. Both ladies went on to describe how there nonetheless has been an upswing in the Calaca economy with increased business activity. New stalls and shops have been opened in and around the market, and when they have electric lights they attract more customers--"If a shop is dark, no one wants to go into it." They added that in some stalls they now use electric meat grinders. Two men joined in the conversation and noted that among the new shops on the main street some are providing welding and vulcanizing services that require electricity. A new ice plant has been opened (Catalina reported at this point that the ice she uses to keep her fish fresh is less expensive than when it had to be brought in from Balayan.)

Catalina's house has been connected, and she expressed satisfaction with the lights and conveniences. She has an electric iron, which she finds a great improvement over her old charcoal iron when she has work to do at the end of the day. She also enjoys her television set (her favorite program is "The Wheel of Fortune," but when the president comes on to give a speech, she turns the set off).

B.4. Sixto M., Pharmacy/Snack Shop Owner and Barangay Captain.

On the main street of Calaca in a place where the motorized tricycles converge, Sixto M. (a man of sixty) has a pharmacy and an adjoining snack shop. He also is the barangay captain and active in town affairs. Prior to the advent of coop electricity in 1974, Sixto only operated his pharmacy, which was lit by Coleman lamps. He described how after there was public lighting on the main street and in the plaza, Calaca underwent a "great improvement" with new businesses (the ice plant and shops) and increased social activities such as meetings, concerts, and a basketball league on the plaza. The influx of people into the downtown after dark prompted Sixto to open his snack shop with fluorescent lights, a refrigerator, and several electric fans. His snack business has been so good he is planning to enlarge and improve the shop (and also hire several more workers). Sixto also raises chickens with a flock that usually numbers between 100 and 300. He sells them either locally or in Balayan and plans to buy an electric incubator, which will increase his flock considerably. He added that in nearby Barrio Cababalo, a group of teachers were borrowing money to launch a similar venture. As a member of the coop, Sixto attends most of the meetings. He is a firm advocate of electricity, stating that people's lives have improved, and with television they are more aware of what is happening in the world.

B.5. Natalio de Leon's Woodcraft Shop.

Natalio de Leon's woodcraft shop in Barrio Pagasa, Calaca, was established in August 1979. The shop purchases wood (an Ilocos Norte variety called *pallo maria*) and fashions it into bowls and trays for export to Japan. The current income of the shop is approximately P 8,000 per week. There are sixty-eight employees, of whom twenty-eight are machine operators. All but three of the machine operators were recruited from outside Batangas, primarily from the Bicol region. One such worker is 27-year old Jose, whose father was a fisherman. Leaving his natal barrio, Jose went to Bulacan Province (east of Manila), where he learned to operate a lathe. He was hired by the shop to instruct the others (it requires about one month to become reasonably proficient). Machine operators are paid on a piece-work basis, with the most skilled workers earning P 40 per day. The shop uses electricity to power its twenty-two woodworking machines (saws, lathes, carvers, and sanders) and for the light bulbs used to dry the varnished pieces. Scraps of wood are gathered by the manager to use as firewood.

B.6. Father Lipat, Priest at St. Raphael's Church (Calaca).

The early settlement of Calaca took place around the church of San Raphael, built by the Spanish in 1836. Located on higher ground, the church and plaza still dominate the town. The surrounding houses, built in the traditional Spanish-Filipino style (incorporating iron grills, hardwood floors, and capiz-shell sliding windows) are occupied by the well-to-do.

Father Lipat, the Parish priest, sat on the veranda of the new social hall with a group of barrio social workers (all of them women). Their meeting had just ended, and Father Lipat explained that they got together periodically to discuss the needs of the poor in the barrios and how such needs could be met. Continuing in the vein of the socioeconomic situation in and around Calaca, he said that the area has been undergoing significant changes in recent years. The uplands away from the coast have an agricultural economy based on cultivation of sugar cane, coconuts, paddy, and pineapples (mixed cropping and a great deal of inter-cropping can be seen along the roads). In addition there are citrus groves, truck gardening and kitchen gardening. Agricultural production has been increasing, and prosperity in some cases is graphically manifest in farmers having their own jeepneys, which they use to transport produce to markets. The poor, by and large, are concentrated in the fishing villages along the coast of the China Sea.

Prior to adopting coop electricity in 1977, a 16 hp diesel generator provided power for the rectory and convent (appliances include a refrigerator and fans, and there also is a water pump), between six and nine in the evening. The generator also lit the church during morning and evening services. Father Lipat finds the coop power to be costly (when gasoline was 60 centavos per liter their monthly fuel bill averaged around P 80, but now that it has risen to P 2.50, the cost would be prohibitive while the coop power runs around P 186). He complained, however, that there were too many outages. For this reason the old generator has been retained, although it actually is not used very much. Nonetheless, the advent of coop power has brought more advantages than disadvantages. There is better lighting in the church for morning and evening services and for those occasions when special holy-day celebrations such as those on Easter and Christmas are held. The new social hall has electricity and will serve as a gathering place in the evenings for meetings and festivals.

Public lighting on the main street and the plaza came just when Calaca's market functions are increasing. Wednesday is the Calaca market day for the region, and so many now flood into the town that Father Lipat has had to add a special 7:30 a.m. mass. The town is the center for the upland agricultural market (fish tend to be sent to Lemery or Balayan). Jeepneys bring cloth and embroidery from Taal while farm goods (notably nails) are transported from Balayan. Vendors from Rosario sell candles in front of the church.

Lights in the plaza and on the main street have stimulated increased social activity in Calaca. There is a new basketball league held in the evening on the plaza, which also is the site for fiestas, musical and dance concerts, and public gatherings. Along the main street the electrically lit shops are open later than before and attract more customers. People now promenade after dark.

Father Lipat related that there has been an increase in agents selling electrical appliances. Some also specialize in purchasing from those who had adopted electricity their kerosene refrigerators, selling them in the more remote areas where power lines have not yet been extended. People have been using appliances to increase their incomes. Some, for example, sell bags of ice and ice candy produced in their refrigerators while others charge neighbors 10 centavos to watch television.

Two problem areas were touched upon by Father Lipat. One concerned the problem of NPC displacing people when they took land for their coop headquarters. This was the case at Barrio San Rafael, near Calaca, where the coop buildings now stand, and complaints by barrio residents have been lodged. Father Lipat pointed out that on the positive side, the presence of the coop has resulted in barrio incomes being raised. The second problem is the social distance that may be occuring as a result of the difference between those who can afford electric appliances and those who cannot. The former have changed their style of living with refrigerators, television, electric irons, and so forth while the latter--the poor--have "kept the old ways."

B.7. Mr. Sarmiento, Elementary School Principal.

Barrio Santo Tomas is actually part of Calaca town, located close to the San Raphael church and central plaza. The elementary school is a collection of low buildings with overhanging eaves built around a very old mango tree. There are 969 pupils and 38 teachers. The principal is Mr. Sarmiento, a man of 55, who has been in education for 34 years. Only the classrooms of grades 2 and 3 have not been electrified, and he pointed out that having electric lights makes a considerable difference because rooms tend to become dark, particularly during the rainy season. Brightly lit classrooms are more conducive to study as is having electric lights in the house. The fees for electricity are obtained from two sources--school funds and fund-raising activities. In the evening the electrified school building is used for barangay captain meetings ("Peace and Security" sessions); for boy scout gatherings; and for handicraft lessons.

B.8. Punciana, a Fisherman's Wife.

Located on the shore of the China Sea, Barrio Salong (population around 3,000) is populated with poor to modest-income fishermen's families. This is reflected in the predominance of houses built of bamboo, wood, and nipa-palm thatching. House lots are small and there are very few kitchen gardens. Most of the settlement is shaded by coconut palms, and everywhere there are the outriggers (bancas) used for fishing. Under a shelter adjoining a small house on piling, a group of women were fixing fishing flies to a long nylon line (the fishing technique here involves dragging long lines with multiple flies). The house and fishing equipment belong to Punciana (age 47) and her husband, who is fortunate enough to own a banca (without a motor). There are six in the family, all sharing the small house. Normally, Punciana's husband and sons go fishing, but from time to time he rents the boat to other villagers, retaining one-third of the catch as his portion. The usual pattern is for the women of the family to take the catch in a tricycle to the Calaca market where they either sell the fish themselves or give it to a vendor for a fee (P 7 out of P 100).

A young man standing nearby was identified as a banca owner. He said that he paid P 3000 for his boat, which he rents for one-third of the catch. He purchased his outrigger by selling some pigs and a carabao, but others make payments in installments.

Concerning electricity, Punciana declared that there were not many houses with connections. Only one house in the barrio has a refrigerator, and it is only used for domestic purposes. Fishermen usually keep their fish in the boat for relatively short periods--less than a day--but some have coolers in which they keep fish cold with ice purchased in Calaca. A young woman helping with the flies related that she and her husband, a fisherman, bought a small house nearby which was already connected. With lights in the main room and the bedroom they pay around 10 centavos a day, which is less costly than kerosene. Her husband rents a non-motorized boat from his brother, retaining two-thirds of the catch. She sells fruit and vegetables to supplement their income.

All of the group felt that the streetlights in the barrio had reduced theft (including stealing of boats). They would like an electric beacon to guide the fishermen at night (but one of them noted that it would not result in increased catches).

B.9. Gregorio, Outrigger (Banca) Builder.

Near the beach in Salong, Gregorio, 29 years of age, builds outriggers under the coconut palms. He is from the barrio where his father was a fisherman, and he learned boat-building by working as an apprentice. The boat that he was completing is a popular one, capable of carrying ten fishermen, and it sells for P 2,000. Typically, this boat was ordered by a fisherman from the locale. The wood is from Mindoro and is brought to Batangas by dealers who sell to the builders. An outrigger such as this requires about three weeks of work. The whole operation is labor-intensive, using hand tools. Gregorio fashions the parts, after which his helpers send the wood. When he has assembled the parts for the hull, another assistant paints it. Gregorio had his bamboo and nipa-palm house connected in early 1979, and he reports that he and his wife are very pleased with the lights.

B.10. Francisco Balboa, Fisherman.

Francisco, now 53 years old, was born in Barrio Wawa, Lemery, one of four children. His father owned an outrigger and fishing equipment (nets, large basins, etc.), but sickness in the family drained their resources, forcing him to sell his boat and nets. This left the family almost destitute. At the age of 20, Francisco moved to Barrio Salong, Calaca, where he worked as a laborer on fishing boats. Eventually he was able to possess the nets, lines, and other equipment needed to participate in share-fishing, where he arranged to go out with a boat-owner and other fishermen with the former paying the costs (including gasoline if there is a motor). The boat-owner takes two-thirds of the catch, leaving the remainder for the others to share.

Francisco married a girl from the barrio and built a house of bamboo and nipa-palm thatching on a very small plot of ground, which he was able to buy for a low price. He and his son continue to engage in share-fishing wherein they rent a motor, purchase gasoline, and go out with a boat owner. They take three-fifths of the catch. The cost of such fishing operations depends on the time spent at sea. Normally, for example, they will leave at 6:00 a.m. and return at sunset. The quest for larger fish, however, requires that they go to sea at 2:00 a.m. and return around sunset. This requires about 11 liters of gasoline (at the current price of P 4.50 per liter). The day before the interview, Francisco and his son rented a motor and bought three liters of gasoline. His wife met the boat and took their share of the catch to market in a tricycle, turning the fish over to a woman who charged five percent for the sale. Francisco and his son realized a net profit of P 22.80.

Francisco noted that a nylon fishing line currently costs P 5, and it will last a week (or less if it involves going after large fish). His family grows no vegetables because it is too time-consuming, so they must purchase most of their food needs (rice, mangoes, string beans, and calabash) and they never buy meat. His children have only been able to receive two or three years of schooling because it is too expensive and they help with family tasks. Although there is electricity in the barrio, few of his neighbors have connections, and there are no streetlights. When asked what he would do with a windfall of P 500, he replied without hesitation that he would put most of it in the bank to earn interest, and he would also buy more food.

B.11. Franco, Rice Mill Owner.

Franco was born in 1949 in Barrio Bocal, Lemery, where his father was a tenant farmer with two hectares of paddy and maize. He also worked part-time in a rice mill. After completing high school, Franco went to Manila, where he worked in several low-paying jobs, finally finding employment in public relations. Subsequently he became a salesman for a large firm (Kimberly-Clark, producers of toilet paper and sanitary napkins). The introduction of coop electricity in Barrio Bocal prompted him to return with the goal of opening a new rice mill. Franco also pointed out that barrio life was better for his family (less crime than Manila, better air, cheaper food, and good education). In addition it was preferable to launch an enterprise where one could draw upon the support of kin and friends.

His total investment in the rice mill amounted to P 50,000, the major item being the Japanese sheller/polisher that cost P 27,000. He received a loan from a local bank in the amount of P 7,000. The remainder came from his savings garnered while he was in Manila and financing from family resources.

The mill has a capacity for milling 100 cavans (5,000 kilos) of paddy per day. The price of milling is expressed in terms of output of rice (P 8 per 50-kilo sack) rather than input of paddy. A ten horsepower electric motor is used to power the huller and polisher. The electric motor is superior to a diesel motor because of the cheaper cost of electricity, the lower maintenance expenses associated with electric motors (replacement parts for diesel are reported to be expensive and sometimes difficult to obtain) and the higher recovery rate of rice from paddy (57 percent recovery with electric motor versus 43 percent with diesel). On the other hand, unreliability of coop power is a disadvantage of the electric motor (we happened to be conducting our interview during a black-out).

The net advantage of the electrified mill over the diesel-powered mill can be expressed by the fact that Franco originally was charging P 6 per sack of rice while the diesel operation across the street (admittedly with somewhat older equipment) was charging P 8. When his competitor complained about

Franco's low prices, Franco raised his profit margin by charging P 8 per sack. The rice mill is operated by Franco's father and his brothers; there is one helper outside the family. His wife supplements the family income by selling potted plants for P 10 each.

Franco has been able to construct a substantial house and purchase a stereo set, two fans, an electric iron, a refrigerator, and a television set. He laughingly observed that his less fortunate kin and neighbors flock to his house to watch television and obtain ice.

B. 12. Vio's Jeepney Body Shop.

Along the main road near Lemery town is a body shop that was opened in August 1979 by Virgilio (Vio) Ocampo (who is a close friend of Franco in Case B. 11). In his early 30's Vio had taught elementary school for eight years, after which he drove a jeepney. He became a mechanic, and then operated a body shop in partnership with his son's compadre (godfather). Two years later Vio opened this shop. He required a loan of P 35,000, and he also received a five-year tax exemption and some training support through the Ministry of Trade's National Cottage Industries Development Authority.

The shop builds jeepneys to order, and it is filled with jobs in various stages of completion. In the yard there were new jeepneys with freshly painted gaudy scenes ready for delivery. With business thriving, Vio has eighteen skilled workers and eighteen full-time helpers. The entire operation is highly labor-intensive with bodies and chassis shaped by hand. Electricity is used to power the welding equipment, grinders, sanders and drills. The shop produces sixty units per year which are sold for P 44,000 (P 25,000 of this is value added by the shop).

B. 13. Electric Appliance Store.

The Nemar Shop is one of five appliance stores in the municipality of Balayan. Established in 1975, its service area nearly coincides with the BATELEC I service area. Prior to the opening of the Nemar store, electric appliances could be purchased only in Batangas City (approximately 50 kms away) or in Manila. The store, which is a branch of an eighteen-store chain, employs a manager (who is a former teacher from Lipa City) and four registered agents. There also are several "tipsters" who get small commissions for locating promising customers. There appeared to be one helper in the store on the day of our interview, and the Balayan branch shares a technician with another branch.

This store sells only new appliances, but the sales agents sometime refurbish and sell repossessed appliances. The best sales areas are the poblaciones of Balayan, Calaca and Tuy. Among small appliances, the most popular items are irons (P 155-160) and table fans (P 260). The most popular large appliance is television (17" and 20" black-and-white models at P 2,450 plus P 350 for installed antenna), followed by stereos and refrigerators (6 cubic foot model at P 2,745). These appliances typically are foreign brands that are assembled in Manila. The store also sells kerosene refrigerators and AC/DC televisions for use in non-electrified barrios. Freezers have been sold to restaurants and a few fishing enterprises. The store does not sell electric stoves; people find it less expensive to cook with gas or wood.

B. 14. Batangas Sugar Central, Inc.

Batangas Sugar Central, Inc. in Balayan (Batangas Province) established its sugar mill in 1968. The mill has been operated by a privately owned corporation but currently is in receivership under the Philippine National Bank. The company owns no sugar land of its own; it simply mills local farmers' cane in return for thirty-five percent of the raw sugar. At the height of the milling season, the mill employs 560 workers. The majority of the skilled workers are from outside the area. When its diesel-fueled generator needed replacement two years ago, the Central switched to electricity. Electric consumption fluctuates between 20,000 and 100,000 KWH/month. Electricity costs approximately twenty-five percent of the cost of diesel fuel, and the mill has been able to increase production as a result of the increased reliability of power associated with the switch to electricity. The Philippines Sugar Commission (Philsucom) has constructed a P 200 million refinery adjacent to the mill and expects to employ an additional 300 workers. It's not clear how important the availability of electricity was to the decision to establish the refinery; it appears to be well-known in business and government circles, however, that power is relatively cheap in Batangas.

B. 15. Sterling Integrated Ventures Cold Storage.

A relatively new operation, the cold storage is owned by the Lopez family, one of the wealthiest in the area. Tuna is caught by fishermen from Mindoro and then delivered by Sterling's boats to the facility in Balayan. Refrigerated trucks then transport the fish to the Pure Foods cannery in Manila. Ships arrive at the facility once or twice a week with shipments varying between three tons and seven tons. A dozen sailors from the Balayan area crew the Sterling boats; casual workers from the Sterling cane fields unload the boats and are paid at a rate of P 15/ton. Locally caught fish are not stored at this facility. Currently the cold storage is being utilized well under capacity.

Electricity is used to operate the P 200,000 freezer that was imported from the United States. It also is necessary to have a standby diesel generator for use during black-outs. The absence of electricity in Mindoro Occidental prevented Sterling from establishing its cold storage facility there.

B. 16. Mr. Agenca, Leader in the Barrio Sinisian Water Service Association.

The Barrio Sinisian Water Service Association in Lemery provides water to 150 families through 24 communal faucets. According to Mr. Agenca, one of the leaders, the Association was established in March 1977 with technical assistance and financial support from BATELEC I and the NEA. BATELEC surveyed possible sites for water and provided the Association with a P 10,000 loan to help purchase an electric pump and water tank and to pay for drilling the well. The NEA provided a P 9,000 loan for the same purposes. The loans were granted for six years, with a one-year grace period. Quarterly amortization payments amount to P 1,100, and the Association's monthly electric bill is approximately P 50. The municipal government donated pipes and other accessories. The barangay donated the land for the pump and tank site and provided manpower for construction.

The members of the Association pay a monthly fee of P 6 per household (households with more than six members pay a higher fee), and the single business member (a small "resort" on Balayan Bay) pays according to a meter reading. The household members of the Association are rice farmers and small sugar planters (both owners and tenants) and fishermen.

The spring water is pumped by a 1.5 horsepower motor into a large water tank and then flows by gravity to the communal faucets. The Association now is planning to install larger pipes and to increase water pressure in order to expand service.

(This is the only case that we observed of a coop providing financial and technical assistance to promote non-household use of power. BATELEC does not have sufficient financial resources to underwrite more power use activities, in part because the coop recently made a P 200,000 advance repayment on its own construction loan from NEA.)

Mr. Agenco rents one-half hectare of "lowland" paddy fields on which he farms C-4 high-yield rice in two crops annually. He also rents a small "upland" holding on which he cultivates sugar-cane. He owns a caribao which he uses for preparing the fields for planting, and he hires a team of local workers to transplant his paddy. On Saturdays, Mr. Agenco usually is in charge of the local cattle market, for which he receives a commission on the total number of sales. His wife, Flora, supplements the family income by embroidering at home. This is done in an arrangement with a contractor (or subcontractor--this business, which appears to be very layered) who supplies the cloth and thread arranging to pick up the final products. Flora receives 25 centavos for embroidering the front section of a blouse. Working steadily she can complete one in a two-hour period, and there are days when she can complete a dozen. Normally she earns around P 5-10 per week, and she noted that the women usually work in groups, lending a social overtone.

The house has been connected since 1977 with four outlets. Flora also purchased an electric iron. She noted that the more brightly lit room made it much easier for her to embroider in the evening, so she was getting more work done.

B. 17. The Don Manuel Lopez Memorial Hospital.

A 50-bed emergency facility of the Ministry of Health, the Don Manuel Lopez Memorial Hospital in Balayan town was established in 1968 as the Balayan Emergency Hospital. Subsequently, it was moved to its present site on the coastal road between Balayan and Calaca in response to a donation of land by the Lopez family. Wealthy and politically well-connected, the Lopez family is said to have expedited government funding of the facility, and in recognition of the family's contribution, the hospital was renamed.

The hospital falls in the middle range of the health services hierarchy in the rural Philippines. Barangay health stations, which are staffed by a nurse/midwife, handle minor medical problems. The two municipal health units, staffed by a physician (one position currently is vacant), provide preventive care and handle routine cases. The Lopez Hospital provides curative care for 300 in-patients per month and 20-25 out-patients per day. Seventy-five percent of its patients are classified as indigent by the hospital chief, Dr. Deogracias G. Kabamalan. The hospital has ambulance service, an emergency room, laboratory for routine tests, delivery room, pharmacy, dental service and family planning services--provided by a staff of 48 (currently four of the seven physicians' positions are vacant). The service area of the hospital includes the municipalities of Balayan, Calaca, Tuy, Lian and parts of Lemergy and Nasugbu; occasionally patients are brought by boat from the island of Mindoro. More difficult cases are referred to the Provincial Hospital or Regional Hospital in Batangas City.

The hospital relies on BATELEC electricity for lighting and air-conditioning as well as for operation of equipment (e.g., x-ray, EKG and equipment for chemistry tests). Unannounced energy-conservation black-outs have been a problem for the hospital. Lights have gone out during operations, so the hospital purchased a 12.5 KV back-up generator. Since electricity also operates the primary pump for the hospital's water supply, a non-electric pump had to be purchased for back-up.

Dr. Kabamalan, who is a native of Laguna and a graduate of the University of Santo Tomas Medical School in Manila, expressed the view that radio and television were not serving effectively as a means of educating rural people in health and nutrition because educational programming was not attractive enough to compete with commercial programming.

CASES CAMARINES NORTE PROVINCE

CN. 1. The New Life Ice Plant and Cold Storage.

Mercedes (population around 6,000) is a fishing port of some importance in coastal Camarines Norte. Out of it operate fishing boats of varying sizes, ranging from small outriggers (bancas) that carry one or two fishermen to large motorized boats (basnig) that accommodate twenty to thirty (for long fishing periods). The town has had a limited amount of electric power since 1950, but it was unreliable and costly. The situation did not change much in 1970 when the Hidalgo Electric Company, based in Naga City, Camarines Sur Province (and owned by a well-to-do family there) took over the operation. In 1978, Canoreco replaced Hidalgo as the supplier of less costly and somewhat more reliable power to Mercedes.

Currently the town has three ice plants. One of them is the New Life Ice Plant and Cold Storage, owned by the Sy family, who have their main office in Lucena City, located along Route 1 on Tayabas Bay in Quezon Province. Miss Corozon Sy, cashier at the plant, explained that her paternal uncle, Julian Sy, the owner, and his brothers fled Sinkiang Province in China when the communists took over. They settled in Lucena City, married Filipinas, and prospered in the ice-and-storage business. Around three years ago, one of the brothers investigated the market situation in Mercedes, and there clearly was a need for additional sources of ice and cold storage, so the Sy brothers decided to open their plant. Initially they relied on a Caterpillar generator for power, but when the Canoreco Coop opened, they purchased electricity from it (although they have continued to maintain their own generator because of the outages). With eight workers (all of them from Lucena City), the plant produces 120 large blocks of ice daily, and most of the customers are fishermen who have storage boxes on their boats to keep fish fresh.

CN. 2. Bicol Enterprises (Ice Plant and Cold Storage).

Located in the port section of Mercedes (where there is a pervading smell of rotting fish), the Bicol Enterprises Ice Plant and Cold Storage was founded in 1950 by the Buenaflores family of Naga City, Camarines Sur. Fred Morales, chief operator of the plant since 1960, explained that initially the plant was powered by a 75 hp diesel Caterpillar generator and in 1971 they began using Hidalgo Electric Co. power (which operated two large and three small units on diesel fuel), which cost less than their own generator. Outages were only a maximum of around three hours. Not long after, the Buenaflores family contracted with Hidalgo Enterprises (of Naga City) to run the plant for a rental fee of P 2,500 monthly. They assumed operations, but even with Hidalgo providing electricity at a subsidized rate, the plant proved a losing venture, so they did not renew the contract when it expired in 1976. The Buneaflores resumed control, closing down the plant for renovations. With a new management headed by Mrs. Lilia Ableneda, the plant reopened in 1978 and began using Canoreco power (which was interrupted late in 1979 by a typhoon, forcing use of the private generator for a period). Mr. Morales pointed out that the Canoreco and Hidalgo (subsidized) rates were about the same--80 centavos kwh industrial rate. He figured that their own generator would cost around P 20,000 per month while Canoreco power monthly rate is around P 15,000. Mrs. Ableneda volunteered the information that the Buenaflores family still had a debt of P 20,000 for plant operations, but they continue to retain ownership "for sentimental reasons."

Fred Morales reported that most of the customers for ice were private consumers while cold storage space was rented by wholesalers in the fishing industry. The ice plant produces 40 large blocks per day, and prior to the opening of The New Life plant of the Sy family (see Case CN. 1.), it was necessary to bring 75 blocks of ice from Naga City by truck (at a cost of P 24 per block plus P 5 for shipping) to meet the local demand. Although 90 percent of the houses in Mercedes have electricity, only around five percent have refrigerators, so the demand for domestic ice still is high. Ice still is needed on most of the boats--the large outriggers particularly need considerable ice to keep their catch fresh when they are out for days.

Demand for cold storage space, however, is seasonal. The peak fishing period is from June to September with large outriggers coming from Bataan and Cavites (with their crews recruited in those places). At that time almost all of the cold storage space is rented by wholesalers who ship fish to Manila and those who keep fish fresh until they can dry them. One big client, Mr. King, ships fresh prawn to Manila and Pangasinan Province north of the capital and also deals in dried fish. Other times of the year, two of the cold storage sections usually are empty.

Fred Morales concluded by saying that the advent of Canoreco power has not resulted in a diminishing demand for ice, and the New Life plant operators were clearly lured to Mercedes by the apparent need for additional supplies of ice. The New Life operation is more efficient--while the Bicol Enterprise has nine workers and produces 40 blocks daily, New Life has only six workers and produces 120 blocks. As a result of the New Life operation, no ice need be transported from Naga City, and the less costly New Life ice has resulted in a lowering of retail ice prices. Because the Sy brothers brought their workers from Lucena City, however, there has been no increase in local hiring.

CN. 3. Anselmo B., Former Fisherman and Manager of a Dried Fish Business.

Barrio Siete, close to Mercedes town, is a fishing community, and on the afternoon of April 17, 1980, it was very quiet because most of the men were out to sea. On the small veranda of a frame house with nipa-palm roof, Anselmo B., a man of 40 years, chatted with some friends. His father had been a carpenter for a firm in Naga City, and when he was young, Anselmo left home to take odd jobs, finally settling in Barrio Siete, where he married a local girl. He worked as a hired hand on fishing boats--the lowest occupation in the community. Then for several years he worked for a Chinese entrepreneur fishing and drying fish (the fish are soaked in salt and water for three hours, after which they are washed, and dried in the sun). In 1954 he left this employment and did various laboring jobs before spending a year in the Tondo section of Manila where he engaged in the dried fish business.

In 1959, Anselmo returned to Barrio Siete and fishing activities. He became one of the organizers of the Samahang Nayong fishing association (with 25 members) when it was formed in 1973. He explained that the association made it possible for those with fishing equipment to obtain loans up to P 3,000 while those without could get up to P 5,000. The loans are for five years with monthly payments of P 100.00 for the larger amount and P 72.63 for the smaller. In 1975, Anselmo received a P 5,000 loan with which he bought an outrigger, a motor, and paint. Eleven barrio-level Samahang Nayons comprise the Area Fishing Cooperative (AFC), and it is through this parent organization that the loans are obtained from the Philippines Development Bank (PDB). The AFC also functions as a marketing organization--the member fishermen take their catch to the AFC in the poblacion (Mercedes) where it is purchased and shipped to Manila. Anselmo gave an example of a catch that the AFC judged to be worth P 100; 10 percent (or P 10) is deducted for the FDB, 5 percent (or P 5) is a commission for the AFC management, and 1 percent (P 1,00) goes to the Samahang Nayon for group insurance (the family of a friend who drowned received P 2,000 from this insurance plan). Anselmo observed that fishermen need a credit program with more favorable conditions than the Samahang Nayon. He also noted that the government's Biyaya Ng Dagap ("Grace from the Sea") loans require collateral that most fishermen are unable to provide. Other sources of credit are the "fishing brokers," local individuals, none of them fishermen, who have a wide range of occupations and who make loans at high interest rates. Anselmo once received a P 4,000 loan from one of them.

Anselmo observed that the fishing community can be divided into four occupational strata: (1) the lowest level is comprised of laborers (he noted that he had been a laborer when he was young); (2) above them are the boat pilots (pilotos), who work out rental schemes with the laborers; (3) the owners (maysadiri) of boats; and (4) the fishing brokers (capitalistas).

Anselmo and his son engaged in fishing with their new boat and motor (they did not hire extra hands, eliminating that cost). In 1978 and 1979, however, there were bad typhoons that prevented fishing for long periods, making it impossible for him to make his regular payments. In 1979, Anselmo began renting his boat and motor and took a job as manager of a dried fish business. The difficulty of repaying his loan was one reason and another was that he decided to quit fishing because three of his friends drowned at sea.

Anselmo adopted electricity in 1978. One motive was to save money because it is less costly to use electric power than to buy kerosene. He paid P 142 for the connection with wiring for a fluorescent light and three bulbs. His son (who lives in the house with his wife and child) bought an electric iron. They find that electricity has brought numerous conveniences to their household. The rooms are brighter and more pleasant. Anselmo also pointed out that the lights were inducements for his grandchildren to study in the evening. The brightly lit main room also made it better for receiving guests in the evening. His son-in-law has an electric fan, which he tried to use to dry fish during the rainy season, but he gave it up when his monthly bill shot up to P 100.

Another advantage derived from having electricity in Mercedes is that the cost of ice has diminished. Whereas it previously cost P 21 for a block, the new New Life Ice Plant (described in Case CN 1) charges P 18 and delivers it free of charge. The result is that the other ice purveyors had to lower their prices.

During the interview, a group of villagers collected on the veranda. A young woman, whose husband is a truck driver for a fish company said that she would like to have their house connected, but their child fell ill, and paying medical bills has prevented it. An elderly lady related that she and members of two other neighboring families were responsible for having street lights installed in the barrio. They found, however, that a family had begun poaching electric power, so she reported it to the authorities. Several of those gathered began discussing the beacon on the beach. They claimed that it was the responsibility of the government, but when the bulb burned out some months ago, it was not replaced. They expressed the hope that the beacon would operate again before November when the seas are particularly stormy. They also pointed out that many of those in the barrio with electricity and coop membership participate in the meetings.

CN. 4. Andres, Metal Worker and Shop Owner.

On April 16, 1980, electricity was introduced into Barrio Cabousay, located some seven kilometers down a relatively busy road from the town of Labo. Not far from the small plaza where the inauguration was held, Andres, age 27, and his wife run a small sari-sari shop. Linemen from the coop gathered there to celebrate the completion of the system in the barrio. Andres was born in Calocan, a Metro Manila urban quarter, where his father had a small vehicle-repair shop. Andres worked there while he was attending school. At 18 he began dividing his time between working in larger body shops and doing metal-work contracts on his own. During this period he met his wife who is from Barrio Cabousay. When Andres accumulated some savings, he and his wife decided to move back to her barrio. Andres pointed out that there were employment possibilities for him and life would be better for his children. Also, the cost of living is lower in the country where food is more readily obtainable and less expensive. Andres added that he also liked the idea that they would be among his wife's kin group and friends of long standing.

In Cabousay, they rented a wood and thatched house (across the road from the site of the present shop), and Andres obtained employment as a metal worker in a Labo body-repair shop. As in Manila, he took on contract jobs in order to accumulate capital. One such job, for example, was on contract with the NPC (National Power Corporation) to repair 20 metal window grills at their Labo headquarters. With this money he bought his rented house and had it moved across the road to a lot which he also purchased. In the front of the house they arranged a small sari-sari store stocked with basic goods, including canned goods (sweetened milk, pineapples, fish, butter, and cheese), cooking oil, several kinds of soap for bathing and laundry, candy, cigarettes, beer, gin (Ginebra), and soft drinks.

Andres began working with a partner--a young man he knew in Manila--to accept contract work, using the body shop facilities in Labo during his free time. Their most recent contract was jeepney body repair and door repairs for the municipal government. Their net profit from both jobs was P 1,000. Andres lends some of this capital to neighbors with interest paid in rice--e.g., a loan of P 100 brings interest of three sacks of paddy or 1 1/2 sacks of milled rice

[redacted]

(one outstanding loan is for P 1,000). Most such loans are made to farmers around two months before the harvest with repayment following the harvest. The rice paid as interest is consumed by Andres and his family (they have two daughters). He hitches a free ride in a jeepney (he knows all of the drivers and does extra work for them free of charge) to his house for lunch everyday so he figures that his daily expenditures only run around P 20 per day or less.

Andres has electricity both in his house and the small sari-sari store. Normally the installation would have cost P 128.60, but he had an old switch box (P 22.50) which he used and he also did the wiring (P 10.00) himself, so the cost was reduced to P 96.10 (--a switch [P 5.00]-- fluorescent fixture and tube [P 37.00]-- "Junction box" [P 4.00]-- wire [P 40.00]-- outlet [P 2.50]-- receptacle [P 4.00]-- light bulb [P 3.60]).

Now that there is electricity in the barrio, Andres plans to open a body shop adjacent to his house. He pointed out that he has a good reputation as a metal worker, there is a lot of activity in the barrio, and electricity makes it possible to do metal welding.

Some of the linemen celebrating in the back began to drift into the shop to join in the conversation. One was Jaime (35 year of age), an NEA employee. He had been born in Mindoro and migrated to Manila, where he married and had two children (he and his wife are now separated). He received training in aircraft mechanics and worked for Air Manila. In 1974 he took a job with the NEA, and he has spent several years in Camarines Norte working on a line-construction team. Here as in other barrios the workers became acquainted with the local residents, which is why they were having their celebration in Andres' shop. He expressed the view that living in the provinces is preferable to Manila life because conditions are better and it is less costly. He also noted that one of the problems the linemen encounter during the construction of the system in a given area is the matter of right-of-way. Often the construction necessitates cutting down coconut ttees, and this brings a flood of complaints.

CN. 5. David, Tenant Farmer.

David is a 45-year old paddy tenant farmer with one hectare in Barrio Calangkawan, Vinzons. His house (he has six children) is of weathered wood with thatched walls and rusted metal roof. Close by is a kitchen garden. His fields also are close to the farmstead. As a result of the 1972 agrarian reform, new regulations on leaseholds have benefitted David's lot--whereas previously he retained 50 percent of his paddy yield, he now can keep 80 percent. His income has, therefore, increased (although now the landlord does not have to provide such things as fertilizer and seeds).

Fields are prepared for planting during the dry season with David and his eldest son breaking the ground with a plow pulled by a carabao. Planting takes place in June after the rains have begun. Last year he cultivated IR 36, which yielded around 50 cavans (45 kilos--25 gantas), per hectare, and this year the Massagana 99 extension agent is coming to instruct on the planting of IR 42, which is supposed to yield around 60 cavans. For transplanting, David hires a team of ten (recruited from the barrio) for two or three days at P 8 per day (he noted that the Massagana 99 agents recommend a total payment of P 120 for transplanting one hectare). The local Samahang Nayon Farmers' Association is the agency responsible for controlling water in the farms. David said that if he can afford it he hires some local labor to assist with weeding. After four months the paddy is ready for harvest, and this requires all members of the family and neighbors who work through a mutual-aid arrangement. The period from September to December is stormy so no farming is done. January is the time to begin the second crop. The total 1979 yield was around 110 cavans. Assuming a single harvest of 50 cavans, David retains 10 cavans for household consumption and pays the landowner the same amount, leaving 30 cavans for market. The last price was P 40 per cavan, so he realized P 1,200 per harvest. For a net profit, however, other costs such as seed (Massagana 99 offers credit), hired, labor, and such would have to be deducted.

David and his family have various ways of supplementing their income. All of them work on transplanting teams for barrio farmers. The family also raises pigs, feeding them on bran from their milled rice, and selling them for P 700 each. David's wife raises chickens and ducks, whose eggs she sells to a Daet buyer. During some of the slack season (the peak of the rainy and dry seasons), David does some net fishing in a nearby river. The kitchen garden and fruit grove also yield gourds, taro, papaya which they sometimes sell. David has a gasoline-powered small thresher which he uses for his own crop and rents (it cost P 1,700 to buy, requires 3 liters of gas for 100 cavans, and rents at the rate of one ganta for every cavan threshed). In addition, his son purchased a used tricycle (with salary he saved and credit), which they operate between Vinzons and Daet, but during the ten months they have had it, the losses outweigh the gains. David sighed, "It is better to raise pigs."

In April 1979, Barrio Calangkawan was absorbed into the town of Vinzons, although David and the group gathered under the tree said that they still felt apart from the town. The electric lines soon will be extended into their area and they are looking forward to it. They are aware that using electric lights is less costly than burning kerosene lamps (normally they will have a lamp lit all night). David drew laughs when he observed that with electric lights, "You don't wake up in the morning with a nose full of soot." He also pointed out that it would be nice to have a refrigerator so he could sell ice water and ice candy, and garden produce and left-overs could be preserved in it.

David ended the interview with some observations about tenants' relations with landlords. The landlords are not happy with the agrarian reform arrangements so they no longer lend money to tenants. They also "squeeze" tenants, berating them about even slight delays in rent payment and unduly criticizing the quality of the paddy the tenants bring as rent payment.

CN. 6. The New Society Lane Group.

On the very southern edge of Vinzons town, behind the elementary school compound, New Society Lane marks the border of Barrio Calangkawan, which in April 1979 was incorporated into Vinzons. The land is lined with mostly modest frame and thatch houses around which are gardens of produce and flowers. One house in the middle of the row is very modern, reflecting the greater affluence of its residents. All of those residing along the lane are kinfolk.

(1) Maria Sancho (Nana Maria), a woman in her 70's, is the doyenne of the lane. Her husband, now 75 years of age, is from the barrio, and in 1945 (after the "liberation") they both went to Manila, where he worked as a sidewalk vendor. In the 1960's they returned to Calangkawan with their six children. Four of the children work as laborers in Manila (Nana and her husband receive periodic remittances from them) while two daughters, both married to laborers, live on New Society Lane. Nana Maria and her husband had one hectare of land which is divided into seven house lots along the lane. Their house and garden occupy one lot but circumstances have forced the sale of several other plots (see below). One daughter (who had training for one year as a teacher's assistant, but is unemployed) and her husband live with Nana Maria, and he supplements his income by shrimping in the mangrove swamp nearby at night (using a kerosene lamp). He keeps some of the shrimp for home consumption and the next day his wife takes the catch to the Vinzons market, realizing around P 1.00 daily profit. Nana Maria crochets on demand with the buyer supplying the yarn. She can complete a shawl in two days and charges P 8.00. She complained that a recent buyer ordered six shawls, which Nana Maria completed, but for which she has not yet been paid. In 1970, she suffered an eye accident, and her doctor's bill was around P 1,000, forcing her to sell the plot of land next door to her sister. She noted that when illness strikes, if they have money they will consult a physician, but if not, they resort to tranditional use of herbs. She observed that in order to get any service at the local rural clinic, one must have "influence."

Nana Maria's house is not connected because they cannot afford electricity. She said that if she came into money, she would make repairs to her house, buy more food, and help neighbors who are in need. She added that she thinks it important to "love God," and avoid being in debt.

Marily (28 years of age), a kinswoman of Nana Maria, lives next door with her husband, a laborer, and their four small children. The husband also shrimps in the evening. Their house is connected (she had just given birth and was unable to talk).

(2) Lucilla. Across the lane from Marilyn's house there is a small bamboo and nipa palm house set in a garden full of varied flowers around a plot of green grass. The man of the house is a kinsman of Nana Maria, and his wife, Lucilla invited us into the main room. She is 37 years old and has three small children. The land on which the house stands belongs to the husband's paternal uncle, so they do not have to pay rent. The husband is a self-employed laborer who gets contracts for a variety of jobs such as construction work or furniture finishing. Lucilla assists him when she can. For example, she has been sanding some rattan chairs in preparation for refinishing. She also keeps pigs, selling the piglets (for P 100 each). She does crocheting on demand for customers who provide the materials. She and her husband managed to save a little capital that they intended lending for interest, but when electric wires were strung along the lane, they obtained information from a lineman about cost, and deciding that electric lights were less expensive than using kerosene, they had the house connected. They find the electric lighting to be very convenient, and Lucilla reported that with fluorescent light in the main room, she can crochet later at night because she is less apt to become drowsy under the brighter light. This enables her to complete work faster--whereas it previously took a week or ten days to complete a sweater, she can now do it in two days.

(3) Armando. Further down New Society Lane, Armando (43 years) and his family (eight children) live in a frame and thatched house on a plot of land he bought from his kinswoman, Nana Maria, who at the time needed cash with which to send her daughter to school. Armando's primary source of income is night shrimping in the mangrove swamp fed by the Vinzons River. Using nets, Armando depends on the tidal action to carry the shrimp up the channels, and he earns around P 15-25 per day, noting that if he missed two days he would have a difficult time feeding his family. A secondary source of income is purchase of fruit (like mangoes) from Batangas, and bananas, yams, and other vegetables from Daet which his wife sells in the Vinzons market at a stall she rents for P 1.00 a day. She nets around P 10 a day. They have one daughter (who appeared in the door with her hair in pink plastic curlers) in college studying education, and a son who just completed a six-month seminar in auto mechanics (and will study in Pili).

Armando and his family adopted electricity in 1978, and he finds that having electric lights permits his children to play later in the evening. Public lighting along the road has been very beneficial to him and others who shrimp in the mangrove swamp because it makes the road brighter and more secure.

(4) Samuel. At the end of the lane, Nana Maria's brother-in-law, Samuel (in his 20's) was busy with his brother-in-law, Rogelio (also in his 20's) cutting logs for wood to improve his house (built of wood and thatch). Samuel's father is a farm laborer in Quezon Province. Samuel does daily labor in nearby Talisay, usually on farms, and during the busy harvesting season he makes as much as P 80 for a six-day week. He supplements his income shrimping and fishing; raising pigs; and sawing logs on contract. His wife crochets on demand. He cannot afford electricity.

Rogelio is a self-employed carpenter (he built a very substantial house for his family), and he, like Samuel, supplements income by shrimping. In July 1979, Rogelio adopted electricity, paying the P 240 installation fee in cash. His motive was to save money because electric lighting is less expensive than lighting by kerosene lamps.

(5) Roberto and Corozon. In front of the modern, well-constructed house, Roberto and Corazon alighted from a large motorcycle. They invited us into the house, whereupon Nana Maria hastily departed (we had the clear impression that she was not friendly with them). Roberto noted that Nana was a relative of his. He and Corazon work for the government in Vinzons, and the interior of the house reflected affluence--an electric floor fan, stereo, modern lamps and light fixtures, and armchairs. They explained that although they had the electric appliances (including an iron) they did not have a refrigerator because the Vinzons market was so close, it was convenient to purchase ice there.

(6) The Moonshiners. As New Society Lane gave way to a path into the mangrove swamp, there are along the road small bamboo-and-thatch houses built on piling over the tidal mud. On the platform before a small sari-sari store a group of men were drinking and laughing. Nana Maria explained that they made illegal alcohol from nipa palm nuts (a strong brew called barikolkol) and palm wine, both of which they sold locally. They came on to the path to invite us to drink with them, and when we inquired about electricity, they pointed to a light on a pole over the store. Yes, they benefitted from it--it lit up their nightly drinking sessions.

CN. 7. Corozon B., Sari-Sari Store Operator and Wife of Tenant Farmer.

A woman in her early 40's, Corozon B. runs a small sari-sari store along the main road of Barrio Mampurog, Imelda. She was born in Vincente, where her father was a coconut tenant farmer. In 1956 she married Luis B. and they decided to return to Barrio Mampurog, his natal village. He took over the tenancy of a seven-hectare coconut farm his father had rented since 1916. In 1956 the farm was sold to Antonio Salsado, a resident of Daet. Under the tenancy arrangement, Luis receives 40 percent of the farm income from coconut cultivation while the owner gets the remainder. The grove has around 500 trees, many of them 30 to 40 years old. Maintenance is largely restricted to weeding and cutting of dead fronds, the burning of which is thought to be beneficial to the soil (no fertilizer is used). Every forty-five days the nuts are brown enough to be harvested, and each tree yields around seven nuts. Harvesting is done by specialists (some of them tenants) who use knives attached to long bamboo poles (the trees here are extremely tall). They are paid P 15 per 100 trees, but the work is considered hazardous because of the danger of being struck by falling nuts.

Most farms have smoke pits consisting of a deep hole and a log rack under a thatched roof. The coconuts are placed on the rack over a smudge fire for around seven hours, after which the outer shell is removed (if a workers is hired to do this he is paid P 8 per 1,000 nuts) and the copra is smoked for five hours (to prevent loss of oil). The copra is then cut in slices and placed in sacks (copra from 1,000 nuts will fill three sacks). According to Corozon, 1,000 nuts will produce about 300 kilos of copra. In February 1979, after the devastating typhoon, the prices soared to a high of P 2.80 per kilo, and as of February 1980 the price had fallen to P 2.20, but by April, copra prices had diminished further to P 1.60.

When the copra is ready to be transported to the Daet market, the landlord is advised so he can be present when the yield is weighed at the dealer's shop. Transport of three sacks is P 1.50. In many instances, the landowner recommends the copra dealer to whom the produce will be delivered. Dealers also extend credit to farmers with no interest for short-term loans (she noted that the banks prefer giving credit to pineapple farmers). The dealer judges the quality of the copra.

Corozon and her husband farm pineapples (currently 5,000) as a secondary crop, planting them between the rows of coconut trees. To do this, they must have the approval of the landowner (who does not share in the profit of this crop). Pineapples take around twenty months to mature, and in January 1980 they harvested around 2,500 which they sold in the Daet market at a profit of between P 30-50 per 100 pineapples. In addition, their kitchen garden produces yams, taro, and manioc for home consumption, and they purchase all of the rice that the family consumes. They own their own carabao (which they use to cart the nuts to the smoke pit), and one pig. Corozon pointed out that it would not be wise to have many pigs because the landowner might suspect that they were using copra as feed. There also is the ever-present danger of theft.

In order to supplement income further, Corozon began several years ago to sell rice and manioc cakes along the road. As she was able to accumulate some capital, she began vending hot cakes at a larger profit. Finally she realized enough cash to be able to purchase some basic items needed to open a small sari-sari shop (on land that is part of the tenancy). She emphasized the importance of being able to afford good educations for her children, all of whom are in school. Their eldest son is in commercial studies in Daet, and he does some part-time tasks for the municipality in addition to selling charcoal and working as a bus conductor to pay for his courses and for a rented bed ("bed spacer") during the school year.

Canoreco electricity has been available since 1978, and Corozon got installation cost estimates from a family friend who is a lineman. She paid P 90 of the total P 285 cost for the house connection and makes installment payments. She wanted electricity because it provides less expensive light than does kerosene, and she felt that it would make evening study easier for the children. She would like to have a refrigerator so she could have ice for the house and also for the store, eliminating the need to buy it in Imelda. She noted that anyone with a refrigerator can make money selling ice candy. An electric iron would also be a welcome convenience. Public lighting has had some effect. Children can play out of doors later in the evening, and "it is good for the basketball players."

CN. 8. Julio, A Young Coconut Tenant Farmer.

Julio, a 23-year old coconut tenant in Barrio Matacong, Imelda, is tenant with six hectares of coconut grove. With his parents dead, he is head of a household consisting of an elderly grandmother and two younger siblings--a sister (who is in 3rd year of high school) and a brother. Another brother, who helped with the farm went to Manila, but they receive no remittances from him. Julio owns their small bamboo and thatch house (which is very sparsely furnished). His father had been a tenant of the Abano family of Daet, and his family has "taken care" of the grove for twenty-five years. There is a smoke pit on the farmstead, and Julio's paternal uncle provides a carabao for him to transport the coconuts. He cultivates a secondary crop of 3,000 pineapples and kitchen garden crops of taro, yams, and areca. They also gather some wild vegetables and fruit for consumption. The children care for some chickens, and Julio just sold a pig that they raised for the past year. In addition, they sell coconut husks at a rate of P 8 - P 10 per sack (currently the lower price prevails due to oversupply). With his own knife and bamboo poles (which telescope into one another to reach the high clusters). Julio is one of the three barrio specialists in coconut cutting.

Julio proudly displayed his transistor radio, but he explained that he cannot afford electricity although it would provide cheaper power for illumination and the radio, and he would like to own a stereo set. Touching on the medical situation, Julio noted that they sometimes go to the rural health center for the simple medicines for such ailments as headaches and stomach problems, but the grandmother's brother prepares traditional medicines, so for many ailments they look to him for cures.

CN. 9. Ludvicio, Coconut Tenant Farmer.

In 1969, Ludvicio, a young man in his 20's, came to the barrio and married a local girl (they now have three small children). He and two friends share tenancy of a 20 hectare coconut grove that is the property of Balariamo Buma, a resident of Daet, who also functions as the copra dealer (he has a warehouse in town). Ludvicio and his two friends have their own bamboo poles and a knife for cutting the ripe nuts at harvest. They often hire extra laborers to help husk the nuts. Mr. Buma provides the carabao to transport the copra to his warehouse, and he also is their source of credit (with no interest for short-term loans). Out of a harvest of 1,000 nuts, Ludvicio receives about P 100. The landowner also is responsible for planting new trees (which take around ten years before they produce nuts). Like many other coconut tenants, Ludvicio cultivates pineapples as a secondary cash crop.

Ludvicio said that he and his wife would like to have electricity in their house, but at present they cannot afford it. He was told by a neighbor that connection would cost P 300, and although they have been saving money, some emergencies have drained their savings. At present they spend around P 11.50 per month. He pointed out that through the Foster Parents Plan, he might be able to get funds to have the house electrified. Foster Parents pays P 35 a month, and in the Palawagan scheme, some 240 families each contribute P 10 from this money to make loans to those on a list who need assistance for electricity for paying medical bills, and so forth. Ludvicio's wife would like an electric iron and also a sewing machine (foot-pedaled or electric) with which to accept contract orders. Ludvicio himself also would like to own a carabao.

CN. 10. Bienvenido Somoza, Furniture Maker.

Bienvenido Somoza is a 40-year old furniture maker in Vinzons Poblacion. Operating from a covered space in his front yard, he builds tables, chairs, dressers and other furniture to order. All of his work is done with hand tools, so he must take the planks that he buys in Daet to a local lumber mill for additional cutting. When he has many orders, he hires a helper for P 15 per day; Mr. Somoza's own income from furniture making is P 20 per day. He learned carpentry as an apprentice in Daet and has been a furniture maker for eight to ten years. He also grows coconut and banana trees on his own land.

Married with four children (ages 7 - 15), Mr. Somoza lives in a wooden house with a nipa roof and no electricity. Others in the immediate neighborhood have electricity, but Mr. Somoza does not want to install electricity in his house because the house is on his cousin's land (the house itself is owned by Mr. Somoza). Eventually, however, he would like to have electricity in his shop so that he could use power tools to increase his output and to do types of furniture making that cannot be done easily with hand tools. Currently the Somozas light their house with two wick-type gas lamps.

CN. 11. Armando Alap's Metalcraft Shop.

In Vinzons town, Armando Alap established a metalcraft shop in 1975 in an area that has been electrified for at least twenty years. Located in his front yard, the shop is rudimentary, consisting of a wooden roof with no walls sheltering the machinery. It produces various types of threshers (powered by 5-7 horsepower gasoline engines) that sell for P 1,100, with value added by the metalcraft shop amounting to P 600. Gross annual sales range from P 20,000 to P 60,000. With no hired labor, Armando operates the shop with four of his children.

Electricity is used to operate a metal cutter, welding equipment, grinder and portable drill. Originally the tools were powered by a 1 1/2 horsepower gasoline engine, but the high cost of gasoline induced Mr. Alap to purchase a second-hand electric motor four years ago. His monthly electric bill for the shop is P 80 - 90. He does not use electricity to work at night.

Prior to opening the metalcraft shop, Mr. Alap had been a tenant farmer on paddy land for sixteen years. He was making an insufficient income for his family of ten children, so he moved into the poblacion and established his metalcraft shop with a P 1,000 loan from his parents. Two years ago he received an inventor's tax exemption through the National Cottage Industry Development Authority (NACIDA); he has not sought a loan from the NACIDA, although he would like to purchase a lathe and a sheet-metal bending machine.

CN. 12. Jose Balce, Rice Mill Owner.

Jose Balce established his rice mill in the 1940's. In April 1978, when the original diesel engine required too much maintenance, he replaced it with a second-hand 25 horsepower electric motor. This reflects a common local pattern wherein rice mill owners are switching to electric power when their diesel engines wear out (and new mills rely on electricity). For a rice mill the size of the Balce operation (120 cavans of palay per day), diesel fuel costs P 800 per month and electricity costs P 500-600 per month. Balce's recovery rate of rice from paddy is approximately 47 percent. The milling fee is P 6 per sack of rice plus the bran, which the mill sells for pig food. The switch to electricity did not affect employment at the mill itself, although it means less business for the mechanic who repaired the diesel engine. To date there's been no need for an electrician to repair the electric motor.

The electric motor cost P 3,500 and was financed by the owner, who evidently is one of the richer members of the community (he was an owner of the municipal electric franchise before the coop was established). In addition to the cost of the motor, it cost P 6,500 to wire the mill.

CN. 13. A. R. Rasco, Rice Mill Owner.

The A. R. Rasco Rice Mill in Vinzons Poblacion was founded in 1974. Two weeks before our visit, the mill switched from a diesel engine to an electric motor. The 15-horsepower second-hand motor was purchased for P 3,200 and permits the mill to process 130 cavans of paddy per day instead of the 80 cavans that were milled with the eight horsepower diesel motor. Rasco's recovery rate is 50 percent; he charges P 7 per sack of rice and returns the bran to the customer. The major problems with the diesel motor were the high cost of fuel and the cost/difficulty of obtaining repair parts. The total cost of switching from diesel to electricity was P 9,000, which Mr. Rasco was able to finance himself. He still keeps his diesel motor for standby purposes (in fact, at the time of our visit, there was a black-out--the Rasco mill was operating and the Balce mill was down).

The switch to electricity has not affected employment at the mill; Mr. Rasco's two eldest sons and two full-time workers operate the mill.

CN. 14. The J. R. Bardon Rice Mill.

The J. R. Bardon Rice Mill in Vinzons Poblacion is a new mill (March 1979) that offers a good comparison between electricity and diesel power. The new ten horsepower Hitachi electric motor cost P 5,400, compared to the P 16,000 cost of an equivalent diesel engine. Electricity costs P 30 per day, compared to an estimate of P 50 per day for diesel fuel. The Japanese milling equipment cost P 35,000. The electricity powered operation has a capacity of 110 cavans of palay per day, whereas estimated capacity for a diesel-powered mill would be 96 cavans daily. The recovery rate is 50 percent. The milling fee is P 7 per sack of rice; bran is returned to the customer. In addition to the owner-manager, the mill employs one worker, although on the morning of our visit there were several men operating the machinery and handling the sacks of palay and rice.

Mr. Bardon previously lived in a non-electrified barrio of Vinzons, where he was a tenant farmer on three hectares of palay. Under the 50/50 sharing formula then in effect, he was making insufficient income to support his wife and six children. A relative of his wife was willing to lend him the money to establish the rice mill. Mr. Bardon hires laborers on a daily basis to help with the palay planting and harvesting; he claims that he does not hire any additional farm labor than when the farm was his only source of income. As a result of agrarian reform, Mr. Bardon's share as a tenant has risen to 80 percent of the harvest.

CN. 15. Armando Malaca, Farm (Paddy) Laborer.

In 1965, when he was 13 years old, Armando Malaca migrated to Carmarines Norte from Camarines Sur. His sister had married a surveyor in the Vinzons area, and they arranged for Armando to join them in order to continue his schooling. After a year of high school, Armando began working for his uncle, who is a share tenant on paddy land in the neighboring poblacion of Talisay. In 1972 he married a woman from Vinzons, and currently they have three children--all pre-schoolers. Armando and his family live in a rented house of wood and bamboo with a nipa roof; they have no electricity, although several houses in the immediate vicinity are electrified. Four months ago they were evicted from their house in Calankawan Sur for non-payment of rent.

Armando works for his uncle for approximately three months out of every six-month growing cycle. At each harvest he is paid seven 50-kilo sacks of paddy, which amounts to an annual income of P 770 at current prices (P 1.10/kilo). Currently he must allocate three sacks of paddy for repayment of P 100 credit that a merchant provides between harvests; this arrangement amounts to a six-month interest rate of 65 percent. The remaining four sacks of paddy per harvest are milled (at a cost of P 14) into two sacks of rice, which the family uses for household consumption. In addition to rice, their diet consists of vegetables around their house. This level of income places the family among the bottom five percent of rural households in the Bicol region and probably among the lowest one percent of all Philippine families.

Armando is unable to pay the estimated P 250 cost of connecting to the CANORECO distribution line that runs down his street. The cost of kerosene for his lamp (*Kinky*) is P 16.50 per month, compared to the minimum residential electricity bill of P 5.40. He feels that he has benefitted from increased security on his street as a result of the street lights that were installed in March 1980 by the new mayor (the municipality pays the monthly fee of P 28.35 per street light).

CN. 16. Jose Gasa, Coconut Farmer.

Jose Gasa lives on a two-hectare coconut farm along the road from Imelda to Daet. He inherited the land from his mother fifteen years ago. Aside from occasional financial assistance from his father, Mr. Gasa relies on the coconut cultivation to support himself and his five children (ages 8 - 18). He and his wife separated seven years ago. The eldest son helps to raise the coconuts and to grow cassava for family consumption.

The family's house, which also was inherited, is a two-story wooden frame house with a cement slab floor, a cinderblock foundation and a corrugated sheet roof. The only furniture on the first floor were two wooden benches. The house is not electrified. Mr. Gasa estimates that connection costs would be approximately P 300; he was told by CANORECO that they would not connect an individual house to their lines unless other households in the area accept electricity. He currently spends P 20 per month for kerosene for lighting; the minimum bill for residential consumers served by CANORECO (0-10 KHW) is P 5.40 per month. Thus, if the relative costs of kerosene and electricity remain the same, savings in lighting costs alone would enable Mr. Gasa to recoup the cost of electrification within two years.

Mr. Gasa's economic situation recently has taken a turn for the worse, in part as a result of rural electrification. His Property is comprised of a narrow strip of land adjacent to the road along which the CANORECO lines are strung. When the lines were installed three years ago, CANORECO cut down one hundred of Mr. Gasa's 240 coconut trees. In accordance with the coop's policy, no compensation was paid. Mr. Gasa said that he gave them permission to cut the trees "because they were the government and I'm just a small guy." He said that the trees of others in the area were not cut because they resisted. CANORECO did not tell Mr. Gasa how many trees they would cut.

The second factor in Mr. Gasa's recent economic deterioration is the series of typhoons that hit the area last year. The damage to his remaining trees has reduced his harvest temporarily to 200 nuts/45 days; under good conditions one would expect to harvest nearly 1,000 nuts/45 days from a stand of 140 trees. In the most recent harvest, Mr. Gasa received P 94 for the copra from his 200 nuts. Since he has a withered arm, he must hire a cutter to harvest the nuts; he paid the cutter P 4 for 200 nuts. Thus, his current annual net income from copra is approximately P 720; as his trees recover from the typhoon damage, however, he can expect his income to return to a level of nearly P 3,600, which would place his family among the lowest 30 percent of rurual families in the Bicol region, and certainly in the lowest 20 percent of families nationwide.[1]

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[1] If one were to apply good harvest assumptions to the pre-electrification stand of 240 trees, one would find that the Gasas' copra earnings would put them in the top 40 percent of rural Bicol families.

An additional indicator of Mr. Gasa's economic situation is the fact that he has withdrawn his children from school because he lacked the cash for incidental school fees.

CN. 17. Reynaldo Nano, President of a BLISS Settlement.

Reynaldo Nano is president of the Magang BLISS (Bagong Lipunan Sites and Services) Project outside Daet. The 2.5 hectare site is a resettlement community for fifty families, funded at P 1 million by the GOP's Ministry of Human Settlements and constructed under the supervision of CANORECO. The National Electrification Administration has been assigned responsibility for establishing a given number of BLISS settlements throughout the nation, and NEA in turn uses the cooperatives as the implementing agencies.

The BLISS project at Magang, established in August 1979, consists of fifty attractive wooden houses with corrugated metal roofs and cement slab floors, each on a 300 square meter lot. The site formerly was coconut land that was donated by a local doctor. Each house has a large living-dining area, two bedrooms and a kitchen with firewood stove. Electricity and a water faucet are installed in each house. Each household is to receive two piglets, but at Magang there have been funds only for one piglet per family. There is a communal fishpond for raising talapia; at the time of our visit the pond was nearly dry.

The residents were told that capital would be provided for the establishment of community livelihood activities, but as yet the residents have been unable to raise the P 1,000 needed for a feasibility study of the proposed mini-lumber yard; to date, they have collected P 100 in donations. They also were told that funds would be provided to start a mini-grocery store, but that money has not materialized. In the meantime, one enterprising resident has begun selling soda, beer, candy and cigarettes in his front yard.

Mr. Nano is a native of Daet; his wife and nine children live with him. He is a part-time carpenter who currently is working on another BLISS project in Vinzons. The Nano family and the forty-nine other families at Magang BLISS were selected from 200 applicants by a provincial development specialist (in this case, a school supervisor) in Daet. The BLISS homes are supposed to be reserved for families with a maximum monthly income of P 400. The occupational profile of current residents includes bus drivers and conductors, a mason, carpenters, casual workers, teachers, government workers and a CANORECO lineman. In some cases, it was apparent that family income exceeded P 400 per month. The families will purchase their homes over a twenty-five year period, through graduated monthly payments beginning at P 50. As yet no house payments have been collected.

The Nano family has a vegetable garden with casava, sweet potato, corn, squash, papaya, taro, and banana. The house has four light sockets and two outlets for the Nanos's radio and stereo. Occasionally they borrow a neighbor's flat-iron. Their monthly electric bill is P 6-8 (the minimum residential charge charge by CANORECO is P 5.40 for 10 KWH). The community has street lights, but there have been no charges from CANORECO yet.

CN. 18. Angelita Oga, Wife of a Coconut Laborer.

Angelita Oga lives in a one-room wood and nipa house with her husband of two years and their two children. The house is in a coconut grove in Barangay Mamporo, Imelda, about 200 meters from the CANORECO lines. Mrs. Oga's parents are tenants on the coconut plantation of Mr. Boma, and the Ogas lived with her parents until three months ago. Her husband works as a laborer for his father-in-law, tending the pineapples that grow among the coconut trees. He also works as a part-time laborer for others in the area. Mrs. Oga plants taro and maize for family consumption and she has two hens. She did not know the details of the family's income, but the family clearly was among the poorest twenty percent of households in Camarines Norte.

The Ogas do not have electricity. Mrs. Oga didn't know about the cost or availability of electricity, but she thought that it must be cheaper than kerosene because her parents' house had electricity. She uses a kerosene lamp for light at a cost of approximately P 1.25 every two days. At that rate she would save approximately P 13 per month by using electricity instead of kerosene, exclusive of connection costs.

CN. 19. Ramon Ebona, Mechanic/Electrician and Coconut Tenant.

Ramon Ebona, a 36-year old mechanic/electrician with the Bureau of Highways in Daet, lives with his wife and five children in Barrio Mampera, Imelda. Their abode is a three-room wooden house with a nipa roof, cement slab floor and iron bars on the windows. He commutes to his job on a motorcycle. Ramon also is a tenant on eleven hectares of coconut land, which means that he is responsible for clearing the area around the trees, replacing dead trees and cutting down the nuts. Five years ago NPC cut 280 trees to make room for its transmission lines (actually Mr. Ebona thought that CANORECO had destroyed the trees) and paid Mr. Ebona P 860 to move his house out of the power line easement.

Mr. Ebona had been thinking about connecting to the CANORECO lines, but he was told that CANORECO wouldn't connect him unless there were two or three other houses nearby that were willing to connect at the same time. Also, he said that he was discouraged by the fact that a typhoon reduced his coconut yield substantially. He estimates that it would cost more than P 300 to connect (actually the excess service drop charge alone to his house 175 meters from the lines would cost nearly P 300). Currently the Ebonas use kerosene for lighting at a cost of P 1.40 every two nights.

L. 1. Fidel Dagami, Supervisor of the Tanauan School of Craftsmanship and Home Industry.

Fidel Dagami is the supervisor of the Tanauan School of Craftsmanship and Home Industry (TSCHI) in Tanauan poblacion. The eight-year-old school, which is patterned after vocational schools in Denmark, offers courses in industrial arts and home economics to 1,058 students from surrounding barrios and from the island of Samar. All the students have completed elementary school, and at TSCHI they take a four-year course of studies that is similar to the general high school courses but also includes job-related training in home industries and craftsmanship. Fifty percent of the graduates continue their studies at the Leyte Institute of Technology, the Tacloban campus of the University of the Philippines or the Baybay Vocational School. The entrance fee at TSCHI is P4 per year; books are free and there is no tuition, although there are some additional activity contributions.

TSCHI is electrified, but the electricity is used only for lighting during the day. There have been requests for night classes, but the frequency of unannounced blackouts makes it infeasible to hold regularly scheduled night courses. With the exception of a power drill, all the craftsmanship is done with hand tools. The school has some light machinery that was acquired from Camp Murphy in Manila and also some donated by the Japanese. The machinery is not being used, however, because it required three-phase wire instead of the two-phase wire that is available at the school. Also, the second-hand Japanese equipment needs repair, and spare parts are very difficult to obtain. Mr. Dagami hopes to upgrade the craftmanship training by acquiring electric tools such as a jig saw, band saw, lathe and circular saw. At present, however, the most pressing need is to complete the rehabilitation of the school building as a result of recent typhoon damage.

L. 2. Evilia Martin, Chief of the Leyte Provincial Development Staff.

In an airless (because of power outage) briefing room in the cavernous provincial headquarters of downtown Tacloban, Evilia Martin, chief of the Leyte Provincial Development Staff, provided the following background on regional development planning:

-- The ultimate planning objective is to develop "Metro Tacloban," extending from north of Tacloban City down the coast to Tolosa. Palo would become a government center, and the current provincial capital facilities in Tacloban would be given to the University of the Philippines.

-- Leyte Industrial Estate is planned for Isabel, on the west coast of the island. The development of the estate, however, will have to await the operation of the Tongonan geothermal power plant at Konanga since several of the planned activities will be heavy power users (e.g., copper smelter and phosphatic fertilizer plant).

-- A mini-industrial estate is planned for the area north of Tacloban City; small-scale wood-processing has been identified as a promising industry for the mini-estate.

- Tacloban port cannot accommodate a large number of ships and is too shallow to serve as an international port, but the government currently is dredging the harbor to upgrade its capacity.

- Economic activity around Tolosa (site of DORELCO) is primarily coconut farming and the retail trade of basic commodities. Sugar cane is cultivated on the western side of Leyte.

- In addition to the absence of reliable electricity, a major constraint on industrial development on eastern Leyte is the scarcity of skilled labor. At present skilled labor for industrial activities must be imported from the island of Cebu. The Development Staff hopes to promote manpower training adjacent to the industrial estates.

- The work attitudes of the dominant ethnic group on eastern Leyte, the Warai-Warai, also are a problem. They are a very easy-going people and less ambitious than those on the western side of the island or in other sections of the Philippines (e.g., Cebu, Batangas, Ilocos Norte).

L. 3. Sam's Welding Shop.

Sam's Welding Shop in Dulag Poblacion was established in 1978 by Manuel Sia, a self-taught welder, who previously was a copra dealer in Dulag. Most of his business consists of repairing jeepneys and motorcycles for people from Dulag Poblacion and the surrounding barrios. The shop is operated by Mr. Sia and one helper, who formerly was a hunter of pigs, ducks and lizards, and has the capability to perform arc welding, oxygen-acetylene welding and lead welding.

Electricity is used to operate a compressor, arc welder, drill and grinder. The electric bill amounts to P30-40 per month. Mr. Sia feels that it would be too expensive to operate his equipment from a diesel generator. The disadvantage of the electricity, however, is that the high frequency of power interruptions, sometimes lasting two days, makes it very difficult to complete repair jobs in the promised time.

Mr. Sia decided to open the welding shop because he was unable to support his family in the copra business. In addition to the welding shop, he owns one and one-half hectares of coconuts which are harvested every ninety days by a tenant. When DORELCO installed the electric lines, they cut sixty of Mr. Sia's trees. He was told that it was compulsory to give DORELCO permission, but to date he has not been paid any compensation.

L. 4. The National Industrial Development Corporation (NIDC) Oil Mills, Inc.

The National Industrial Development Corporation (NIDC) Oil Mills, Inc., of Tanauan is a government-owned and controlled corporation that operates as a contract copra processor for the International Copra Exporting Corporation (Interco).

According to plant manager, Mr. C. Parrilla (who was wearing a t-shirt on which "NIDC Oil Mills Inc." was inscribed), Interco buys locally produced copra and sells it to NIDC for crushing. Interco then purchases the coconut oil from NIDC for shipment overseas or to Zamboanga for further processing into salad and cooking oils. Only one-fifth of locally produced copra is processed at the Tanauan facility; it is cheaper to ship the copra to mills elsewhere in the Philippines (Cebu, Legazpi, Davao) than to expand processing facilities in Leyte. In fact, NIDC assumed control of the mill after the Philippine National Bank foreclosed on the private firm that previously operated the mill. Mill capacity is 120 tons of copra per day. The mill currently employs 85 people.

Coop electricity is used only for lighting and as stand-by power for the three diesel generators (750 KVA) that provide power for the milling operation. The high cost and unreliability of DORELCO electricity make diesel generators a preferable power source for productive uses. A recent review of the power situation revealed that it would be approximately 45 centavos per kilowatt more expensive to use electricity from DORELCO than to rely on the diesel generators.

Mr. Parrilla made some interesting observations about coconut production in Leyte. Basically, he said, the farmers are very conservative, a situation reflected in their clinging to the belief that it requires 90 days for a coconut to reach sufficient maturity so that it can be cut while it has been demonstrated that only 45 days is required (this is considered the maturation period in Camarines Norte as has been noted). By the same token, farmers of field crops continue to use carabao and work fields by hand rather than experimenting with mechanization. A new hybrid coconut tree (local varieties cross-bred with varieties from the South Pacific) that is more productive and shorter in height (making harvesting easier) has been introduced, but the conservative farmers have refused to adopt it.

L. 5. The Pepsi-Cola Bottling Plant.

Established in 1962, the Pepsi-Cola Bottling Plant serves the islands of Leyte and Samar. Sugar is shipped to the plant from nearby Negros, concentrate is supplied from Manila and bottles are imported from Taiwan and Japan. The plant operates one shift per day (six days a week) and in eight hours can produce 8,000 cases of regular-size Pepsi or 5,500 cases of the family size. The plant itself employs 88 people, but approximately 400 people work for Pepsi throughout Leyte and Samar.

The principle source of power in the plant is a four-year-old Cummins 525 KVA diesel generator. DORELCO electricity is used for lighting and occasionally bottling operations, but the frequency of black-outs makes it infeasible to rely on coop-supplied power for production purposes.

L. 6. Manuel Caetano, Barangay Captain and Small Farmer (Owner).

Manuel Caetano is the thirty-one year old Barangay captain in Barrio Alegre, Dulag. He owns a one-hectare farm on which he alternates paddy and maize; he also grows some squash which he sells with the maize at the market in Tacloban City. The farms around Dulag (which are very small) are cultivated by both tenants and owners in a sharecropping arrangement wherein the owner receives thirty percent of gross output and the tenant receives seventy percent. The tenant is responsible for all expenses.

The farm is Mr. Caetano's primary source of income (he sometimes works as a laborer). Mr. Caetano was the principal source of information on the failed attempt to provide irrigation for local farmers with an electric pump. Two years ago the Farm Systems Development Corporation (FSDC) initiated a small-scale irrigation project for forty families who were cultivating approximately forty hectares, growing one crop of maize (which is ready to harvest in three months) during the dry season and one crop of paddy during the wet season. The goal of the FSDC project was to enable the farmers to raise three crops of paddy per year. The plan was to use electricity to pump water from the Daguitan River into the previously unirrigated fields. The total cost of the pump house and irrigation ditches (which had to be extensive because the plots were so scattered) was estimated to be P60,000. The government provided the capital, which the farmers were to repay over time through an Irrigators' Service Association (ISA) to be organized by FSDC. The ISA also would be the instrument for managing the water.

The farmers abandoned the project after one season, primarily because the pump and pipes were not able to distribute sufficient water to the fields. Accordingly, the irrigated paddy harvest was not as good as the normal dry season harvest. Moreover, there were additional costs, The electricity bill, which never was collected, amounted to P3,000. Irrigated farming also required the hiring of transplanters; in rainfed paddy cultivation, a single farmer could handle the seeding by the broadcast method. FSDC didn't coordinate the project with other agencies. DORELCO's only role was to connect the electricity and to read the meter. There was no coordination with Masagana 99 technical assistance. The ISA never became a functioning entity; since it was supposed to maintain the pumping equipment, it is not surprising that the pump eventually broke down. Finally, a flood eroded the area near the pump house so that at the time of our visit, the intake pipe did not even reach the waterline of the river. Clearly this was a case of a poorly engineered, ill-planned development activity in which electricity was only an incidental factor. It's not obvious whether a properly engineered irrigation project would have been better served by an electric pump or a diesel pump; given the frequency of power interruptions in the DORELCO service area, however, it would have seemed prudent to give very serious consideration to a non-electric pump.

L. 7. Billy and Bonifacio, Fishmongers.

Julita is a small poblacion (population around 9,000) and market town inland from coastal Dulag. The surrounding area is agricultural with coconut farms and some paddy cultivation, mixed with sugar cane and pineapple production. There also is some abaca (the plant from which Manila hemp is made) grown in scattered areas. By 11:30 a.m. the market was empty except for two fishmongers who were selling the last of their fish to a small crowd. Bonifacio, the older of the vendors, has three sons, all of them out of high school and working in a printing press in Manila. They send occasional remittances and from time to time they visit their parents. Billy, a stout young man, has two very small children. Billy and Bonifacio cooperate in their vending, going to Tacloban every morning to purchase a large metal wash bucket of fish, which they bring back to Julita (using ice to keep the fish fresh) and place in styrofoam containers. Some fish are put out on the wooden counter for the customers to inspect. Bonifacio's wife supplements their income taking in wash, but Billy's wife is occupied full-time with household tasks and caring for their children.

Both households have electricity, which is used only for lighting. Both said that one of the major advantages of electricity was that it was less costly for lighting than was kerosene. They also noted that having electricity in the market was very convenient because it was better to have enough light to enable them to sell after dark. Having electric lights in the cockpit (which they pointed out was unfortunately moved to the other side of town) permitted the fights to be held in the evening. When asked what they would buy with a windfall of money, Bonifacio responded that he would first establish a larger fish business, after which he would fix up his house, and then he would buy a refrigerator to supply ice to the business. Billy felt that house repairs were the most important thing, after which he would invest in the fish business and then buy a refrigerator.

L. 8. Cecilio G., Owner of a Small Restaurant.

The downtown of Julita consists of two blocks of small stores selling wares needed on the surrounding farms, and there is only one small restaurant that also has some canned goods and fresh vegetables (which farm women bring into town) for sale. Cecilio G. has owned the restaurant for five years, and previously he had been a full-time copra merchant. Julita is in an area where coconut and abaca (Manila hemp) farming dominate, but the landholdings are small (coconut farms are around 1-2 hectares ("pocket farms") which produce a seasonal crop.

Cecilio's only help in the copra business was his wife (to hire a laborer would cost around P100 per month). The coconuts are harvested every 90 days (it was 45 days in Camarines Norte province) with 100 trees yielding about 1200 nuts. After processing, 1000 nuts produce around 300 kilos of copra, which Cecilio and his wife would gather in Julita and transport to Tacloban by bus or jeepney, delivering it to the Chinese-owned Granix (Drand Export) Company. Cecilio noted that all of the shop proprietors in town are dealers in copra, abaca, and paddy, all of which are transported to Tacloban.

Electricity has improved Cecilio's business by permitting him to remain open until 10:00 p.m. rather than 8:00. He has two fluorescent lights and a refrigerator (Hitachi). His wife, however, still cooks using wood and coconut husks. DORELCO has around 11,000 members and they lured 2000 to their last meeting with raffle prizes (electric fans and refrigerators), free transport, and a free meal.

L. 9. Andres Acero, Laborer.

Andres Acero, 35, (who sports an arm tattoo stating "Prisoner of Love"), husks and smokes coconuts for his brother who is a share tenant on more than one hectare in Barangay Cabatuan, Dulag. Their father was a tenant rice farmer until he was killed by the Japanese in 1942 (a date which does not jibe with Mr. Acero's claimed age). Mr. Acero attended school through the third grade. Currently a widower, he and his nine children (ages 2-16, all of whom are in school) live in a nipa hut on land owned by his family. He cannot afford the connection fee for electricity (the neighbors have electricity), so he spends approximately P2.50 per week for the gasoline in his two lamps. Actually, this expense is less than the minimum monthly residential bill for DORELCO power (P13.10).

The Acero brothers harvest the coconuts every ninety days; their current yield is approximately 300 nuts per harvest. Andres husks the coconuts and smokes the copra in a small smoker in the yard, at which point it is sold to a Chinese copra trader in Dulag at a price of P1.20 per kilo (1000 nuts yield approximately 300 kilos of copra). After deductions are made for paying the climber (30 centavos per tree) and Mr. Acero (P1 per 100 coconuts husked), the proceeds are split 50-50 between the landowner and the tenant.

Mr. Acero works as a part-time laborer in Dulag. Although we were unable to get a reliable estimate of his annual income, there can be little doubt that he is among the poorest individuals in the Dulag area.

L. 10. Augusto, Radio Repairman.

In Barrio Cabatuan, Dulag, Augusto (age 50), his wife, and six children live in a frame and nipa-palm house along the main road. Augusto was born in Manila where he remained for six years after marrying, working during this time for an insurance company. He also studied radio repair, which he did as a hobby. Leaving the insurance company, he drove a taxi. Augusto's wife's family owns coconut land in Barrio Cabatuan, and in 1966, he accepted a proposal from his father-in-law to finance a radio-repair shop in Dulag town. His wife, however, was discontent in the town, so they moved to a house in Cabatuan owned by her father. There Augusto set up his shop, and since there was no electricity, he repaired transistor radios, using a battery-operated soldering iron. After the DORELCO Coop electrified the barrio, Augusto had his house connected, enabling him to work at night using an electric adapter and soldering iron. Most of those in the vicinity with battery radios began buying adapters so they can run them on the less expensive electric power. Augusto supplements his income working as electrician for two rock combos -- "The Fatima Combo" (named for Barrio Fatima) and "The Pagasa (Hope) Combo." They are kept busy playing at fiestas during the April - June season, after which the musicians go to work in Tacloban clubs. Augusto also fishes, and his wife farms paddy and vegetables on some of her father's land. They have endeavored to give their children educations, and their eldest son, who helped Augusto with radio repair, was accepted in the DORELCO Coop training program upon completion of high school. After a 30-day training course, in 1977 he became a lineman and earns extra income doing repairs during his free time (while we were interviewing, the son drove up on a large motorcycle).

L. 11. Santiago Piamonte, Fisherman/Farmer.

Santiago Piamonte is a 77-year old fisherman/farmer in Barrio San Jose, Dulag. His home is a three-room wooden house with a cement slab floor and nipa roof, located in a barrio that straddles the coastal road to Tacloban City.

Mr. Piamonte has seven children, two of whom are school age children still at home.

Every morning in his small motorless boat (which he purchased for P90 in 1979), Santiago fishes with hook and line. Almost all of the fishermen in San Jose have their own boats; most of them have motors. Previously, Santiago had worked full-time on his one hectare plot of coconut trees (approximately 200 trees), but the low price of copra and the rising cost of supporting his family led him to take up fishing, too. He sells his fish to various buyers at boatside; a good day's catch yields P6-7, which he considers to be a good price. After lunch, when the sea is rougher, Mr. Piamonte tends his coconut land and a few banana trees. Since he is old, he hires a climber to harvest the nuts. He also hires someone to husk the coconuts and smoke the copra. His wife does not work outside the home.

Under ideal conditions, 200 coconut trees would yield 1400 nuts per harvest (every 90 days on Leyte). An annual total of 5600 nuts would translate into approximately 1680 kilos of copra, which sell for P2000. Because of the storm damage, however, many coconut stands in the area are producing one-quarter of the ideal yields. Thus, annual gross income from one hectare of coconuts could be as low as P500. Since cutting and husking costs are about P30/1000 nuts, the range of net income from one hectare of coconuts in Leyte would be P450-P1850. Mr. Piamonte does not appear to be at either extreme of that range, so his net income from coconuts can be taken to be the mid-point of the range, i.e., P1150. It's even more difficult to obtain a precise estimate of his fishing income because the frequency of his fishing is so uncertain. If he were to fish two of every three days (probably an overestimate for an old man with a small, motorless boat), he would have an annual fishing income of nearly P1100. Thus, it appears that Mr. Piamonte's total annual income is approximately P2750; in times of higher coconut yields it might be as much as P3450. This level of income would place his family among the bottom 25 percent of families in the rural Eastern Visayas and the lowest 20 percent of all Philippine families.

The Piamontes adopted electricity when DORELCO extended its lines to Barrio San Jose. They use electricity for lighting only, even though it would be cheaper to light with gas lamps. Also, they have to buy gas for use during the frequent power interruptions. Nevertheless, Mr. Piamonte prefers the fluorescent lights to the gas lamps -- for convenience and cleanliness. Also, he claims that his children study more with electricity. If he could afford electric appliances, his first choice would be a fan, followed by a stereo. There are street lights along the main road that bisects the barrio, but Mr. Piamonte would like to see additional lights further back in the barrio.

L. 12. Sylvia Lopera, Rural Bank Manager.

Sylvia Lopera is the Acting Manager and one of the incorporators of the Rural Bank of Tanauan in Tanauan poblacion. A native of Leyte, Mrs. Lopera worked as an administrative officer in a private firm in Manila for four years before returning to Leyte to establish the Bank in June 1979. Most of the incorporators live in Manila. The capitalization of the Bank is P100,000 ($13,600); as yet it has not received counterpart funds from the Central Bank. The Bank has 900 depositors; the average deposit is P200. There are five employees.

Most of the Bank's loans are agricultural (rice, maize) or commercial. The typical agricultural loan is made for one year with a 12 percent interest rate and a two percent service charge. The maximum loan is P5,000. There is no technical supervision by Masagana 99 extension agents. Secured commercial loans, primarily for financing inventories of sari sari stores, are ninety-day loans at twelve percent interest plus one percent service charge; unsecured loans carry a two percent interest surcharge. A few industrial loans have been made for handicrafts and ceramics activities to finance the costs of raw materials and labor expenses. These loans require collateral or a co-maker. Mrs. Lopera felt that the Bank's contribution to local development would not be realized until local people become more familiar with the concept of borrowing from an institution and repaying according to a fixed schedule. Educational campaigns currently are underway to introduce barrio residents to the advantages and mechanics of depositing their savings in a bank. She also cited the lackadaisical character of the Warai-Warai people of Leyte as an impediment to saving and investment.

The Rural Bank of Tanauan participates in the Biya ng Dagat (Grace of the Sea) program, in which Bureau of Fisheries funds are lent to rural banks for in-kind loans to fishermen (e.g., boats, engines, nets). The Tanauan Bank currently has twenty-five borrowers in this program and is in the process of screening a second set of borrowers. The loans have a six-month grace period and a five-year amortization period. An interest rate of ten percent is charged, and there is a two percent service charge that is collected at the time the loan is made.

The Bank is electrified, using the electricity for lighting, fans and calculators. Sometimes there is overtime work conducted at night. The Bank does not have a backup generator. Mrs. Lopera noted that the local businessmen are thankful for electricity but complain about the high rates. She feels that they don't understand the difference in generation costs between hydroelectric power and oil-fired plants. She feels that the high cost of electricity in the area is an obstacle to industrial investment but that the service itself is acceptable.

L. 13. Father Penaranda, Parish Priest.

Dulag is a small, pleasant market town on the coast of Leyte Gulf, and the main street is lined with shops, interspersed with a few larger enterprises. Away from the downtown there is a somewhat nondescript Catholic church next to which is a simple rectory. Father Penaranda received us there and offered coffee while we explained our research. The original church was very old, and prior to the American landing at Palo beach in 1944, the navy shelled the entire area (the resistance fighters had warned the population to evacuate back into the hills), and the church along with most of Dulag was destroyed. The new church was built during the post-war period when funds were scarce.

At the present time, the Dulag economy is largely based on agriculture (copra and maize are the major products), but landholdings are relatively small. Fishing also is important in the local economy. Father Penaranda emphasized the need for economic development in the area. He cited the unsuccessful electrified irrigation project that had been attempted in Barrio Alegre (described in Case L. 6.). Despite this failure, he added, some kind of irrigation along the river was needed in order to increase agricultural production. The marketplace is a center for the fishing and the agricultural sectors, particularly on Thursday, which is the market day for Dulag (each poblacion has a different day of the week for regional marketing).

Electricity has not made any great changes in the town. Most businesses along the main street do not use it during the day, although some have refrigerators that produce ice which is sold. In the church, electricity is used for the loudspeakers for the most part. There is electric light in the office of the Dulag high school, but none in the classrooms of that school or the primary school. The local health clinic makes little use of electricity (it is closed in the evening). In Father Penaranda's view, the major hindrance to economic development in Dulag is politics -- there is too much in-fighting for any meaningful project to be implemented. There is need to draw people together in order to attain the needed cooperation to carry out economic programs. There also should be better roads into the back country to make them available to the Dulag market.

L. 14. The Pang Sisters, Entrepreneurs.

Clara and Toni Pang are middle-aged spinsters, who with their elderly brother, Joe, run the Red Lumber Yard in Dulag. Their father, who was Chinese, was killed in 1935 while visiting China during the Japanese invasion of that country. The Pang family were in Dulag when the American bombardment of the town began prior to the landing at Palo. The house was hit by shells and as they fled to the hills, Toni was wounded in the arm with shrapnel (she still bears the scar). After the "liberation" the three Pangs launched their business, the Red Lumber Yard, which clearly has thrived. Currently their lumber yard/garage is in a newly constructed building on the main street of the town, and it also houses a hardware section. In addition to the company's trucks there was a new car and a jeep parked in the garage section. Abutting this structure is their residence -- a large Spanish-style house with tile roof.

The Pangs bring their lumber (lavan wood, similar to plywood) from the Abuyu area, some 25 kilometers away, where it is cut by hand. The lumber (which has a reddish color from which the business gets its name) is piled in the main part of the structure. When orders are received, the wood is cut again using saws powered by motors that burn crude oil. They employ one skilled and two unskilled workers. The Pang sisters noted that they do not use electricity from the DORELCO Coop because the crude oil is less costly. At P2.20 per liter it also is less expensive than gasoline which is P4.40 per liter. Furthermore, they added, having their own generator is a guarantee of power not only for the saw but also for the electric lights in the business establishment and the house (where their appliances include a refrigerator, a mixer, fans, television, and a radio). Power from DORELCO, they complained, is very unreliable and the town experiences frequent outages. Perhaps, they observed, the advent of geothermal power will change things.

The Pang sisters had definite ideas about the needs involved in future development. With no large landholdings in the area, the agricultural sector is too conservative, with farmers relying on very traditional techniques using carabao, hand labor, and crude implements. There also is a pervading "laziness" that they attributed to the Spanish colonial period and the "manana influence" (they added that the Americans were "unselfish" in their colonial rule and helped the Philippines to develop and modernize). Cheap and reliable electricity would help development -- and here they noted that despite its shortcomings, the DORELCO power prompted the opening of vulcanizing and welding shops on the main street. Rising oil prices, they concluded, have affected the whole process negatively.

L. 15. Pacifico V., Fisherman/Small Landowner.

With its bamboo and nipa houses, outriggers (bancas), under the cool shade of the coconut palms with the blue Leyte Gulf in the background, Barrio San Jose looks like a travel poster paradise. Sitting in a small shelter on the beach, Pacifico V. (46 years of age) explained how his father (who had owned four hectares of paddy) and his mother had been born in the barrio. He, however, did not inherit any land, so he had to become a share-fisherman, going to sea with a boat-owner and other fishermen to share expenses and the catch. The usual pattern here is for people from the barrio to meet the boats to purchase the catch, although larger fish are transported to Tacloban where they command a better price. In a good week when the weather enables steady fishing, Pacifico can earn between P100 and P150. Pacifico also began marketing fish and was able to accumulate some capital as his children left school and began working (one daughter runs a sari sari store). This enabled him to purchase one hectare of paddy land in Mayoga, some 12 kilomteres from Dulag. The rent from this land has been a needed supplement to his income. In 1979, with capital borrowed from a well-to-do relative, Pacifico purchased a small outrigger and a gas motor which he uses on a share-basis with other village fisherman.

Pacifico had his house wired, permitting one bulb but no appliances, and while there are too many outages, he still finds it a convenience. There are no barrio lights nor any beacon on the beach. He noted that some villagers have purchased refrigerators from which they sell ice and ice candy.

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PROGRAM DESIGN AND EVALUATION METHODS

Manager's Guide to Data Collection (November 1979)

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